

MARINE REVIEW.

VOL. XVI.

CLEVELAND, O., NOVEMBER 11, 1897.

No. 20.

An Output of Twelve Million Tons.

It is now more than probable that the output of iron ore (lake and rail shipments) from the Lake Superior mining region will aggregate 12,000,000 gross tons, or about 2,000,000 tons more than during any season of the past. Shipments to Nov. 1, as reported officially from the dock managers to the sales agents of Cleveland, foot up 11,270,283, as against 9,093,207 tons on the same date in 1896. When the November shipments, which will undoubtedly exceed 500,000 tons, and the season's rail movement are added to these figures of Nov. 1, it is quite certain that the aggregate will be full twelve millions.

It is no wonder, therefore, that the season of navigation is closing without great interest in the lake freight market, except as regards the position of the soft coal shippers, who are now bidding up rates, in some cases above 50 cents a ton to both Lake Michigan and Lake Superior points, but who will be unable to move all the coal that will be required, no matter what the advance in rates may be. The heavy ore shipments show how fully the ore dealers took advantage of deep water and low rates to move ore in immense quantities, when it was found, two or three months ago, that there was to be a demand during the winter for about all of the ore that could be produced. It is fortunate that the present consumption of ore gives promise of cleaning up this heavy supply before another season's business is begun. Within the past week transactions in the iron industry have included quite a large amount of business for the early part of 1898, but there is nothing of the nature of a boom about the market. The strongest feature of the iron industry, in fact, is the disposition of sellers to avoid high prices, on account of the disastrous results of unreasonable profits in the past.

Much Trouble Over a Small Case.

During full four weeks, ending with Saturday last, Harvey D. Goulder of Cleveland and C. E. Kremer of Chicago were steadily engaged on a law suit, which was being tried to a jury before Judge Dellenbaugh in the common pleas court at Cleveland. The case was not an important one for either of the lawyers, who have met in the United States courts in many big suits, but they fought every inch of it in the slow and unsatisfactory manner in which marine cases always drag on jury trial, and were awarded for their efforts by a disagreement. It was an action brought by the Shores Lumber Co. of Chicago and Ashland against the Wolverine Barge Co. for some \$23,000. The Wolverine Barge Co. built the steamer Adella Shores at Gibraltar, Mich., and sold her to the Shores Lumber Co. The latter company now claims, in substance, that they did not get a good ship; that the vessel was poorly constructed, and that they had to spend practically the amount for which they are suing in rebuilding her. The answer from the other side is that the vessel was examined on the stocks before she was purchased; that she was overloaded shortly after going into commission; that she was damaged by stranding on Skilagalee reef, etc. Of course these are only main points in the case. There was no end of testimony introduced in connection with matters hinging upon the principal issues, and with everything new to the jury the trial was necessarily long drawn out and furnished some amusing incidents.

Look at Your Bills of Lading.

A Cleveland vessel owner who a few days ago chartered one of his vessels to take coal from Ashtabula to Lake Linden at 50 cents a ton was surprised, upon looking over the bill of lading that was forwarded to him, to find that the printed portion of it contained this clause: "It is also agreed that the shipper shall be held blameless for any delay in discharging cargo." This clause is not altogether new, as it is made a part of bills of lading by a few coal shippers, but imagine the further surprise of this particular vessel owner when he found the following note written at the bottom of the same bill: "Consignee not to be held responsible for any delay in discharging cargo." Of course the bill was not signed by the vessel man, who in these days of coal shortages throughout the northwest could afford to be independent with the shipper of the coal. It is not probable that such a document would stand in law in event of unusual delay to the vessel, if it had slipped through after being signed in blank by the captain, as is often the case, or if it had been hurriedly signed and no attention given to these clauses. It would seem, however, that vessel men handling bills of lading will do well to be at all times fully acquainted with their provisions.

The new dock for the Duluth & Iron Range Railroad at Two Harbors will cost about \$185,000 and will have a capacity of 38,000 tons. There will be 208 pockets and the dock will be 1,248 feet long, with a crib end of 50 feet and an approach of 600 feet. The height will be 55 feet. The erection of this dock in the place of an old dock that will be torn down will give a total capacity of 137,000 tons at this port, or a shipping capacity of close to 3,500,000 tons in a season. At Duluth the No. 2 dock of the Duluth Mesabi & Northern road will be extended 576 feet, giving 17,000 tons additional capacity.

M. A. Bradley of Cleveland is about to leave the shipping community in the Western Reserve building and remove his office up town to one of his own big blocks. Although he has some twenty-two wooden boats, he says that his vessel interests are no longer an important part of his business.

Detroit's Share of Ship-Yard Work.

Detroit, Nov. 10.—With each week the Dry Dock Engine Works of this city announces one or two new contracts for the application of Howden hot draft to lake steamers, and it would seem that the work that is accumulating here in this line, together with the hull work on two passenger steamers to be built at the Wyandotte ship yard, will give the two concerns—Detroit Dry Dock Co. and Dry Dock Engine Works—their full share of the winter's business in ship building. As an indication of the progress that is being made with the application of this draft system to lake vessels, it may be noted that in 1893, when it was first installed in a lake ship, the horse power involved was only 12,592; it increased in 1894 to 15,264; in 1895 to 26,671; in 1896 to 43,224, and now, up to Nov. 1 of this year, the total horse power on the lakes is 54,010 in forty-two vessels. From present indications the important question with the management of the engine works will be to conclude, early enough, arrangements that are now going on with other owners who are figuring on the draft, so as to bring their vessels here before the close of navigation and have them equipped during the winter. These contracts involve, of course, in most cases, the construction of new boilers and alterations in machinery, and when taken collectively, they represent a large amount of work.

The latest order for the Howden draft is in connection with the contract for a new steel passenger and freight steamer, to be built by the dry dock company for Dunbar & McMillan, and which is to run between Michigan City and Chicago. This steamer will be in a general way similar to the Wyandotte, built here some time ago. She will be 160 feet long over all, and with engines of 800 horse power will have a speed of about 15 miles an hour. Engines will be triple expansion with cylinders of 15, 24 and 38 inches diameter by 24 inches stroke, and there will be two boilers of cylindrical type. The vessel is to be ready for service next June. E. C. Dunbar of Grand Haven is the founder of the line between Michigan City and Chicago, on which the new boat will be put. For three years he has operated the small steamer Taylor on the route, and says his success has been such as to warrant the larger boat. Maurice McMillan is the youngest son of Hugh McMillan, president of the dry dock company, and a brother of Secretary Gilbert McMillan, of the company. This is his first business venture.

The dry dock company has also secured from the Detroit & Cleveland Steam Navigation Co. the contract for extensive improvements that are to be made in four of the big side-wheel passenger steamers operated by that company. The steamers Alpena and Mackinac are each to receive another tier of staterooms, and the Detroit and Cleveland are to have a few more added to their upper tiers. All the dining-rooms are to be rebuilt and fitted with the patent ventilating apparatus used so successfully upon the City of Buffalo.

At the West Superior Ship Yard.

West Superior, Wis., Nov. 7.—A rapid repair job on the whaleback barge No. 116 was completed here a few days ago. The vessel was in dock only three days, and in that time twelve plates (two of them keel plates) were taken off, four being replaced by new plates and eight rolled and replaced. In addition to these there were twenty-two damaged frames, two floors, two corrugated fenders 16 feet long, and five girder stiffeners, as well as some ceiling and six dents to be fixed. Half of the bottom was caulked and a large number of rivets hardened up. The pneumatic caulker was used on this job and worked very well. With the new air compressor installed the barge company is now prepared to do the greater part of its work with pneumatic tools, which is a big advantage from the standpoint of expense. There was some overtime on this job, and the strong light produced by the ten arc lights of 2,000 candle power each, gave the yard in the vicinity of the dry dock a day-light appearance.

The mold loft has been lengthened 100 feet and several arc lights put in. Another time-saving device is a telephone connecting the drawing office and the mold loft. The foundations for the new gantry crane are completed, ready for the columns. About 450 tons of material is in the yard for the two new vessels and 1,700 tons is on the way. H. F. Cowdin of West Superior was the lowest bidder for the machine shop and the work of construction is now being pushed along.

It has been proposed to ask the government to bestow a medal upon Capt. Frank Root of the Minnesota line steamer Mariposa for skill and courage displayed in the rescue of two survivors of the ill-fated steamer Idaho. If Capt. Root will consent to recognition in this way, the medal will undoubtedly be secured though a special act of congress may be required to cover a case of this kind. The experienced vessel man can alone appreciate the danger and skill of an act like that performed by Capt. Root and his crew. This paragraph from resolutions adopted by the Buffalo Merchants' Exchange puts the matter in good form: "In bringing a great steel steamer, nearly 350 feet long, in such a heaving sea, alongside the spar to which the two unfortunate men were clinging for their lives, with a skill and nicety which enabled the rescue to be successfully made, Capt. Root and his officers and crew not only proved themselves possessed of the highest skill and discipline as seamen, but showed a courage, coolness and nerve which belong only to the truly brave. Their seamanship and their courage were both brought to a supreme test and both proved unsurpassed." Members of the Buffalo organization were also thoughtful in referring to the praise accorded Capt. Root by the owners of the Mariposa. A valuable property belonging to them was subjected to much additional danger by Capt. Root's exploit, but they proved by their immediate commendation of his conduct that with them humanity takes precedence of a selfish prudence.

COMMERCE OF THE GREAT LAKES.*

CHARLES E. WHEELER, FOUNDER OF THE CLEVELAND STEEL CANAL BOAT ENTERPRISE, PRESENTS IN INTERESTING FORM TO NEW YORK ENGINEERS SOME FACTS ABOUT THE LAKE TRADE.—A COMPOUND GAS ENGINE FROM WHICH MUCH IS EXPECTED.

It was the intention, in the preparation of this paper, to spare you the infliction always attending an array of figures and statistics, and this for two reasons. First, the data relating to the commerce of the lakes are easily accessible in the innumerable pamphlets, reference books, and other literature whose figures and comparisons are complete; secondly, and principally, because it seemed possible to treat the subject along general lines and perhaps interest you in what I believe to be legitimate effects of commerce on the lakes—effects fraught with great significance to the industrial world, and, it is not too much to say, involving the commercial supremacy of America. But I soon discovered that the plan was impracticable; that without frequent appeals to the figures which government bureaus, painstaking students of economics and journalists have compiled, there was an entire lack of perspective, a sense of incompleteness, a loss of proportions. Reluctantly I was compelled to amend, in part at least, my original plan, and thus it happens that if facts familiar to a degree of triteness are recited, necessity must plead their use.

The disastrous panic of 1893 was not without its benefits. It not only revealed the necessity of a reform in our monetary system, a lesson as yet blindly unheeded by the nation, but taught as well the need of industrial economics, and along this line most commendable progress has been made. During the past three years every manufacturer's office has been a school-room, whose instructor has been Necessity, and the lesson that of applied economics and cheaper production. Mr. Carnegie, for instance, was an apt student and learned the lesson quickly. He built a railroad from the south shore of Lake Erie to his furnaces on the Monongahela and cut the rail-carrying charge in two. He went beyond that—availing himself of the dilemma of Mr. Rockefeller, possessed accidentally of several large deposits of ore on the south shore of Lake Superior, he was able to place himself in a position, as regards ore supply, to compete with the world, at the same time lowering the transit cost of the ore from the mine to his railroad. Mr. Rockefeller in turn saw meagre profits, unless, availing himself of the deeper channels furnished in recent years by the government, he had larger boats to carry his ores than have been running in the trade. He built a dozen of them, and thus it happened that more than half of all the steel tonnage in the merchant marine of the United States, built in 1896, was the product of our lake ship yards; and surely our pride, in that we now own more than half of the merchant marine of the United States, as regards boats of 1,000 tons burthen and over, is quite pardonable.

Everywhere, less noticeable because on a lesser scale, the same trend towards the same end is to be found. It has not received the attention it deserves—the constant, determined, intelligent effort of the American manufacturer, during the years of financial trial, to open new markets, stop wasteful expenditures, cheapen production. With returning prosperity, he is rash who will set limitations on American trade abroad or at home, a result of the discipline of 1893-'94-'95. The growth of our export trade in the iron list is unmistakably genuine, recognized and frankly acknowledged by English competitors. The Duke of Devonshire, at the meeting of the Barrow company directors, spoke of it as "alarming." The London Times, commenting on his declaration, marvels at the magnificent scale of operations at Homestead, where it finds furnaces each producing 200,000 tons of pig iron per annum, the average capacity of the English furnaces being less than 24,000 tons per annum. During the last month or two rails for Liverpool have been coming to tide-water all rail from the Cleveland district. Nails and iron rods have been going abroad in generous quantities. The future is full of hope if unwise legislation does not create more artificial barriers than the ingenuity of the American manufacturer can overcome.

Contributing to this happy condition of affairs, the cheap transportation on the lakes has been a factor of prime importance. The transporting interests on the inland waters have not failed to meet the new situation with intelligent effort and splendid courage. It was inevitable that cheaper transportation should come. The 20-foot channel from Duluth to Buffalo is practically completed, and the invitation to larger boats and cheaper rates could not be denied. Besides, the traffic itself is of such magnitude as to compel a minimum rate. Over that course of commerce must come the nation's breadstuffs, its lumber, its iron and copper ores, in quantities that pass comprehension. The figures for 1897 are, of course, not yet complete, but there is little doubt, if any, that the most prosperous year will be equalled, even surpassed. If this proves true, over 38,000,000 tons of freight will have passed through the Detroit river in 1897. Load that freight in cars, twenty tons to the car, place the locomotive at New York and the caboose will be in New York as well, but between the two nearly 2,000,000 cars will be found, extending across the continent to San Francisco, back again to New York, again across the continent, again back to New York. It is a greater commerce than that of Liverpool or London, foreign and coastwise, greater than both combined. It exceeds the total entries and clearances in the foreign trade at New York, exceeds the total of like entries and clearances at all the seaports of the United States. I am speaking of quantities, of course, not values. Imagine, if you can, the uses to which the freight is put, the industries it nourishes. Sixty-six per cent. of all the ores used in the United States comes through the Sault, and, notwithstanding the bright outlook and flattering showing made by the Alabama and Tennessee districts, the percentage of the total amount of ores used is not only markedly in favor of the Superior ores, but the percentage increases year by year. Two-thirds, then, of all the ores used in this country come from the south shore of Lake Superior and are the sole source of supply of such mills as those of the Carnegie company, the Illinois Steel Co., the Johnson company, the Cleveland Rolling Mill Co., and others that are now confessedly equipped to compete for foreign trade. If our hope in the future supremacy of the American iron and steel maker is well-grounded, surely we may look for its justification in the furnaces between Cleveland and Pittsburgh. There, if anywhere, must be found

the means by which in an iron age this country may assume a commanding position in the iron markets of the world.

And the whole matter depends on cheap transportation. Remove the chain of lakes and no railroad or system of railroads could hope for a moment to place the 140 different iron and steel manufacturers in the central states district in a position to compete with foreign mills, and in the catastrophe thousands of allied industries must inevitably be abandoned. For the coal, for the coke, is in western Pennsylvania and the ores over 900 miles away. No railroad in America is better equipped to transport freight cheaply than the Lake Shore & Michigan Southern. Its grades are light, its tracks and roadbed unsurpassed. The cost per ton mile in 1896 on that railroad was 3.81 mills; the cost on the lakes .99 mills. We have this year reduced the latter figure fully one-third in the operation of the larger boats. We have been bringing ore from the south shore of Lake Superior to Cleveland at a rate of but 15 cents per ton over the ordinary railroad switching charge in any of our large cities. We have been taking coal back at one-third the New York lighterage rate. To reach such results has demanded the most rigid regard for economies in every direction. It has worked a revolution in loading and unloading cargoes. It became necessary that appliances should be such that 6,000 tons of ore could be loaded into a boat, the boat trimmed and ready to depart for her eastern terminus within four hours after tying up to the dock. It became necessary that at this end of the line those 6,000 tons should be unloaded in ten hours. It became necessary that forty cars an hour, each car containing twenty-five tons of coal, should be lifted up bodily one at a time, and the contents discharged into the boat as easily as a laborer flips his shovel.

When Mr. Carnegie amazed the world last spring with his low quotations and other mills followed, let it not be forgotten that it had been impossible but for our ship yards, the genius of the mechanical engineer, and our steamship organizations, which have availed themselves of every known appliance for the economical conduct of their business. Had it not been for them and the lakes, Mr. Carnegie had sought in vain for his foreign market, Mr. Moxham had returned from Liverpool empty-handed, and the Cleveland rod and nail mills had never dreamed of Japan and England for profitable sales. The commercial supremacy of America in iron and steel manufacture is impossible but for the great lakes. And now let it not be thought that the greater part of that traffic is the carrying of iron ores. It is nearly a half of the tonnage, it is true, but in value occupies but fourth position. The total value of freight passing through St. Mary's Falls canals in 1896 was over \$195,000,000. Of this amount wheat must be credited over \$47,000,000; flour, \$34,000,000; unclassified freight, \$31,000,000. Iron ore, with \$25,000,000, comes next, closely pushed by copper with \$23,000,000 to its credit. If the grain shipments out of Chicago and the lumber shipments from Lake Huron be added, and again there be added the value of the coal and merchandise shipments from Lake Erie to Detroit and Lake Michigan ports, the importance of iron ore in the list is not so readily recognized, and it will be seen that what I have said of the lakes and its relation to the iron industry applies quite as well to wheat, corn, oats, flour and possibly copper.

It is almost certain that the indirect effects of lake transportation are of greater importance than the direct. Mr. Blanchard, in his argument of March, 1894, before the committee of the United States senate on interstate commerce, made a significant and, as I believe, absolutely truthful statement in these words: "I contend," he said, "that after rivers, lakes, oceans and economic forces have spent their combined natural and national powers in determining rates which are reasonable, such rates cannot be made excessive by combination." Mr. Blanchard was defending railroad pools, a question alive today and destined to command careful public consideration in the years to come. As a representative of the railroad interests, his plea may be that of an advocate, yet the fact is he was entirely correct. No railroad or combination of railroads can dissociate itself from the traffic means we are considering. It is a controlling factor, and if Duluth can ship her flour from that port to Liverpool for 14½ cents per hundred—a privilege she enjoyed for a brief time the past summer—its effect is instant upon every railroad that has flour mills to protect or grain to haul to them. And then, too, it is not iron ore, flour and wheat that alone monopolize the low rate. The class freight annually carried over the lakes between the great commercial centers, Chicago, Milwaukee, Detroit, Toledo, Cleveland and Buffalo, and beyond in connection with the rail lines and the Erie canal, is an item concerning which, unfortunately, no accurate data are at hand, thanks to a law which does not exact reports of any considerable statistical value; but the fact that all your trunk lines whose western terminus is Buffalo own and operate their own boats, and the fact before cited that the unclassified freight in the Lake Superior trade amounts in value to over \$30,000,000 per year, hint at the enormous value of the total class business transacted in the lake trade. None of the trunk lines may ignore it and its influence is far felt. If it became a traffic necessity for the Lake Shore & Michigan Southern and the New York Central & Hudson River railroads to approximate the lake and rail or lake and canal rate on any commodity from Chicago to New York, be sure the other trunk lines will meet it, and give their tide-water terminals the same rate, not omitting the differentials. As was the case this summer, even the north and south lines, such as the Illinois Central, must, of necessity, take a hand, protecting their gulf termini against the competition thus forced on them. Now, while its effects are of little consequence, perhaps, in regard to higher class freight, there can be no question but all the 6,000 railroad stations east of the Mississippi and north of the Ohio river, reap a decided benefit in the carrying cost of the lower class freight and commodities; for when through rail rates are reduced between Chicago and New York, for instance, because of lake competition, they are simultaneously reduced between intermediate points because of the long and short haul clause of the interstate commerce act. The effect is widespread, often disastrous to the carrier, but at least yields this comfort—that the present unmistakable tendency towards concentration of railroad interests, or the enactment by congress of a law permitting railroads to pool, is a menace of academic rather than real interest. So long as our water highways are open, the railroads have a competition that cannot be overcome.

There is another reason why this competition is irresistible. In the building of boats and their machinery, the naval architect and marine engineer may hope reasonably to keep in advance of the maintenance of

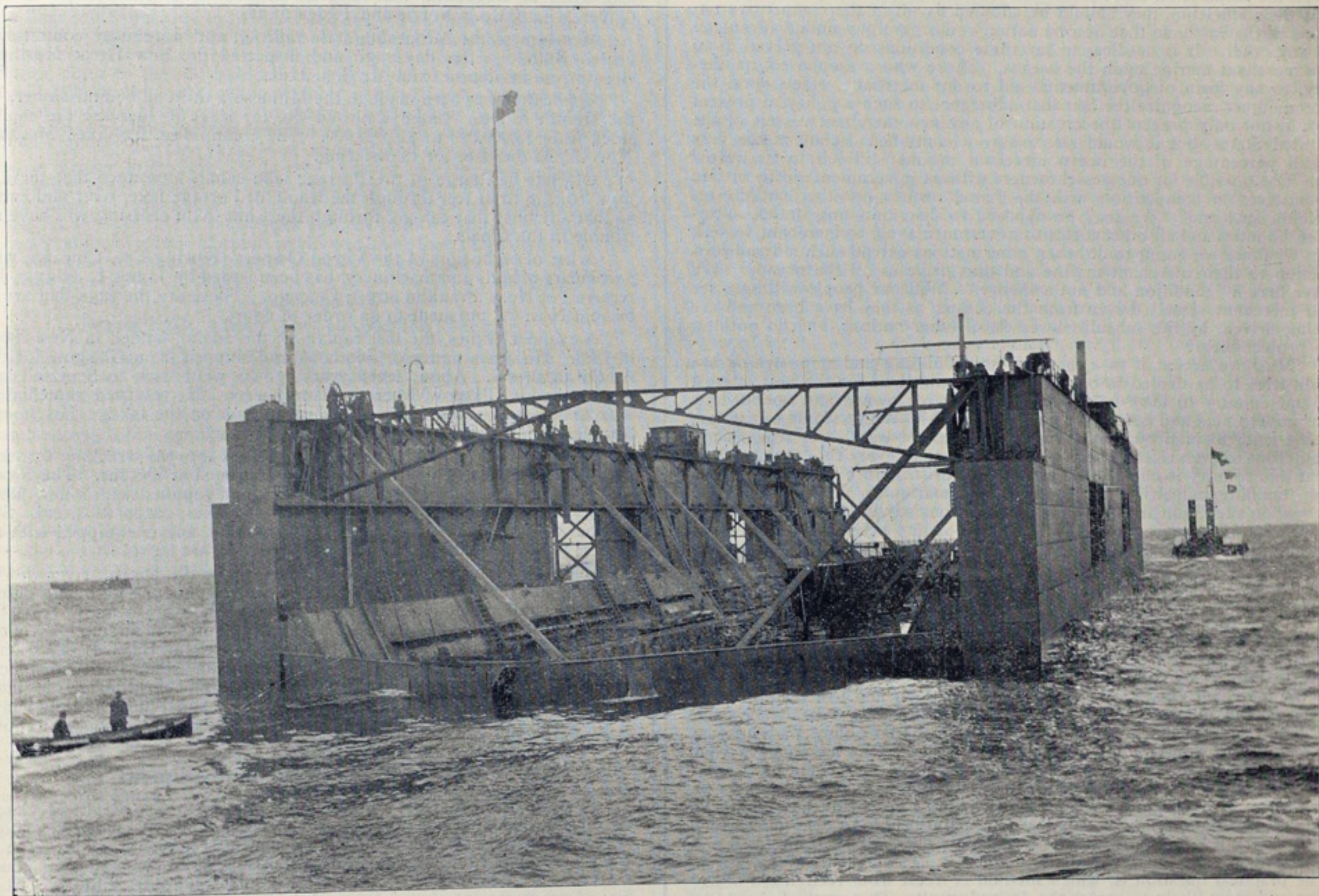
*Read at the fifth general meeting of the Society of Naval Architects and Marine Engineers, held in New York, November 11 and 12, 1897.

way engineer, the master car-builder, and the superintendent of motive power. Walking through the Globe ship yards one day with Mr. Parkhurst, he picked up a piece of coal the size of a walnut and remarked: "You would hardly think that little lump of coal will carry a ton of freight a mile, would you? And yet that is what it will do on our better class of boats." It is true; fifty-five hundredths of an ounce of coal per ton mile is the record. Now, such results are not to be expected in the performance of a locomotive; at least they are not in sight. Such economies are associated with triple and quadruple expansion engines, and it is worthy of note that for the first time in the history of ship building in America we on the lakes are now building our freighters with quadruple expansion engines. Then, too, our waterways are being deepened, our boats being enlarged. Until last year they were less than 400 feet long. We are now building them 475 and 500 feet in length over all.

There is in a workshop at Cleveland an internal combustion engine built for the company with which I am associated. It weighs about two tons, and is, if I mistake not, the first compound gas engine that successfully meets all requirements. Its cards show an indicated H. P. of 114, and a thermal efficiency of 39.5. Making no claim whatever to a technical mechanical training, I am perhaps treading on dangerous ground, but this at least is known—that, reduced to steel strains, we have an engine of 92 H. P. per ton, a record far surpassing that of the *Turbinia*, an engine that exhausts at atmosphere and that may be built to any power, if some of your own brightest marine engineers are not in error. In any event, it is certain that the principle of a compound gas or oil engine is now

The Big Pontoon Dock at Havana.

The mammoth floating dry dock illustrated on this page arrived at Havana, Sunday, in tow of one of the New Zealand company's steamers, after a passage of 6,500 miles from the works of her builders, Messrs. Swan & Hunter of Wallsend-on-Tyne. The distance from the Tyne to Havana over the course followed by steamers is less than 4,500 miles, but in order to take advantage of trade winds, the big pontoon dock was towed over the longer course followed by sailing vessels. This dock, constructed to admit the largest vessel of the Spanish navy, was fully described in the Review of Sept. 23. It was constructed in five parts, which were so firmly linked together as to withstand the force of heavy ocean weather, which was undoubtedly encountered several times on the long and tedious passage (nearly two months) across the Atlantic. The lifting power of the dock is 10,000 tons. In the walls, which are about 6 feet thick, there are a large number of valves and pumps, all worked by electrical machinery. Through these valves water can be drawn into or ejected from the great chambers which are to be found on either side and in the depth of what may be termed the floor. Thus, if filled, the entire dock is submerged, and this submersion can be regulated according to the size and structure of the ship to be repaired. Once sufficiently below water the vessel is floated in. Then the pumps are vigorously worked, and with a weight of 10,000 tons the pontoon can ascend until at last it is high and dry. The position of the ship is easily regulated so that her keel rests upon the center blocks, and once there, what are known as the bilge blocks, having



Pontoon Dock in which Spanish War Vessels will be Repaired at Havana.

thoroughly understood, and whether the present device fulfills expectations or not, assuredly the time is not far distant when important results will come from the untiring efforts of mechanical engineers to transfer the source of power from the boiler to the cylinder. I mention it because indicative of a possible revolution in mechanics that will work economies in the engine room of a vessel impossible to the locomotive, and thus increase the already marked difference between the cost per ton mile by water and that by rail.

Clearly we have not yet sounded the possibilities of cheap transportation by water, and with their discovery one may be justified in believing that their application can nowhere be productive of more beneficent results to mankind than on those waters to which are annually consigned the products of the vast plains of the west, the nation's food and the supply of her workers in iron.

Mr. A. F. Yarrow, famous as a builder of high speed vessels and a special type of water tube boiler, was given a dinner by Major W. H. Wiley at the Engineers' Club, New York, a few evenings ago. Several representative marine engineers of this country were present.

Hunters' Rates—Via the Nickel Plate road to designated points in the northwest, and southwest; also to local points in western Ohio and northern Indiana.

previously been placed ready, are made fast with the aid of movable wedges. Two large cranes at the rear of the dock are then ready to do whatever heavy weight lifting may be required, and numerous smaller contrivances of the same kind at the sides are prepared for what may further be necessary. Messrs. Clark & Stanfield of No. 11 Victoria street, London, are the inventors of this type of floating dock.

It is safe to predict that throughout the Lake Superior iron mining districts the close of navigation will see less ore in stock at the mines than at the end of any shipping season since 1890, at the close of which year the stock piles were swept with brooms to get the last pound of ore. The Gogebic mines, which have probably suffered more severely from gorged stock piles than the producers of any other range, are more completely cleaned out of ore than at the close of any season for the past ten years. The Menominee, Marquette and Vermillion ranges are also engaged in shipping the last of a large number of big stock piles which have been eyesores for several years. All of this assures a great deal of work for a year to come to men who stand very much in need of steady employment, and have suffered much in the past four years for lack of it.—Ishpeming dispatch.

All charts sold by the Marine Review are corrected to date of sale.

A Merchant Marine.

ANOTHER INTERESTING LETTER FROM MR. FRANK J. FIRTH, PHILADELPHIA, ONE OF THE VICE-PRESIDENTS OF THE LAKE CARRIERS' ASSOCIATION. "IF THE AMERICAN PEOPLE WILL UNITE IN AGREEING UPON WHAT THEY WANT DONE," HE SAYS, "THEY MAY BE RELIED UPON TO FIND A WAY TO DO IT."

Editor Marine Review:—You are rendering a valuable public service in opening your columns as freely as you have done to information of every description of interest in connection with the effort to restore the American merchant marine upon the oceans. There is no more profoundly interesting and important problem than this, demanding the attention of our national legislature. It is a problem all of our people, irrespective of their political or financial faith, should unite in an earnest effort to solve. It involves the commercial importance and the safety of our nation. Our people have various opinions as to the theoretical correctness of a policy of "paternalism," so-called. Many believe all competitive business should be carried on under such conditions of freedom to all as would result in the "survival of the fittest." Others deem it better for the general good that the work of the world should be more generally distributed over its surface, and among its inhabitants, rather than to permit a few localities or individuals to monopolize the important industries they may be best calculated to develop. All of the theories proceed upon the assumption that natural conditions shall prevail. To completely test their efficiency they should be adopted by all of the competitive nations of the earth, so that no one nation could have any undue advantage of any other. It is needless to say these conditions do not prevail as to the merchant marine upon the oceans. Those who are opposed, on theory, to any form of governmental aid to our merchant vessels upon the oceans must recognize the fact that adherence to such a policy at present would not only prevent the creation of any new merchant vessels of the United States, but it would also insure a continued decline in the very small percentage of the ocean merchant marine still left to us. How can it be possible for our vessel owners without government aid to sustain themselves in competition with the vessel owners of other nations receiving such aid? We may be opposed to discriminating duties, subsidies, bounties and all other forms of governmental aid to merchant vessels, but what are we going to do when other nations extend such aid and protection to their merchant marine and thus drive us off the oceans? We have here a "condition and not a theory." Will our people willingly see our merchant vessels driven from the oceans, as they have been and are being driven, by the subsidized vessels of other nations, and do nothing to protect them?

Must we accept it as a fact that ship building and ship owning are industries to be denied to our people? Would it be for the best interest of our country to have its important ship yards owned and operated by our government and devoted to naval uses only? Where would our sailors come from to man our naval vessels in event of war? For reasons too numerous to even refer to here, it must be clear to every thoughtful citizen that this country is entitled to, and should insist upon having, prosperous ship building industries, and the merchant marine on the oceans needed to sustain such industries. While other nations sustain their ship building industries and ocean marine by subsidies, or any other form of governmental aid, our government must extend a like support to its industries, if they are to be permitted to exist. These are facts to be universally known and accepted or it will be impossible to agree upon the national legislation they call for. Before attempting the solution of any problem it is wise to first be sure that all interested parties agree as to exactly what the problem is. Cannot all interests unite in support of the proposition that the United States must have prosperous ship building industries within its borders, and that it must have under its flag such a share of the merchant vessels on the oceans as has a fair and just relation to its exports and imports? The next step will then be to unite in agreeing that our government must, as a permanent national policy, undertake to extend to our ship building industries, and to our ocean merchant marine, in some form, whatever aid is necessary to place our people on a commercial equality with the most favored foreign nations with which we compete. If these propositions are generally accepted there must be enough intelligence among our legislators and people to determine which of the very few legislative methods available had best be resorted to and persisted in. No method will be perfect or acceptable to every citizen. The practical question is, which method is freest from recognized objection and most likely to secure the desired result. That method should be freest from objection which is clear and straightforward, setting forth in a business-like way exactly what the commercial obstacles are that are to be overcome and what draft they involve upon the national treasury. Whether the method is an indirect one, such, for example, as is proposed by a resort to discriminating duties, or a direct one, such as are all subsidies, bounties, etc., the money must be diverted from or come out of the national treasury, and the amount required should be known in advance as definitely as may be possible. It must be liberal or it will fail to insure the desired result. It must not be prodigal or it cannot be permanent.

This is a question of vital interest to our whole country. The farmer, miner or manufacturer of the interior who may never see the oceans, over a thousand miles away, is nevertheless directly interested in cheap ocean transportation, and in having the say \$200,000,000, that are now paid in ocean freight on our products, collected on our own vessels, and expended among our own people. And further, the restoration of the merchant marine means the development of prosperous ship building industries along our ocean shores, which, together with the communities that supply them with their material, insure a profitable market for the products of the western farms, mines and factories.

Citizens of the United States may cross and recross the 3,000 miles of ocean separating their country from Great Britain without meeting a single merchant vessel flying their country's flag. They may pass up the Clyde between the miles of busy ship yards that line its banks to Glasgow, with its nearly one million inhabitants. They may travel around Glasgow in every direction through communities tributary to and supported by the Clyde ship yards. This is only typical of many other localities in Great

Britain. In all this prosperity they will see the results of the intelligent and regular support the government of Great Britain has at all times, and under all parties, liberally extended to its merchant marine.

Will our country persist in the "do-nothing" policy that has practically destroyed ship building and ship owning on the ocean as American industries, or has the time arrived for a change in this policy and for our people to demand and secure a share of this international competitive business?

If the American people unite in agreeing what they want done, they may confidently be relied upon to find a way to do it.

Philadelphia, Nov. 5, 1897.

FRANK J. FIRTH.

Around the Lakes.

Charity shoal, northeasterly part of Lake Ontario, is now marked by a gas buoy.

Port Huron officials are offering free dockage to all vessels that will lay up at that point during the winter.

A steel shaft, the first in the Lake Superior iron mining district, will be constructed shortly at the Aurora mine, Gogebic range.

In accordance with plans made up when an order was placed for a new steamer, the Cleveland & Buffalo Transit Co. has increased its capital stock from \$500,000 to \$750,000.

T. F. Cole, for a number of years manager of the Buffalo Mining Co.'s properties at Negaunee, has resigned to become superintendent of the Oliver Mining Co.'s Norrie and Tilden mines.

Members of the Minnesota state railroad and warehouse commission visited Buffalo a few days ago and inspected the new Great Northern elevator, on invitation from Mr. J. J. Hill.

Application has been made to the Minnesota railroad commissioners by the Duluth & Iron Range Railroad Co. for leave to increase the capital stock from \$3,000,000 to \$10,000,000. The commission has fixed Monday, Nov. 22, as the date for the hearing.

Officials in charge of the Portage lake canals announce that there is now from 18 to 21 feet through the whole of Portage lake, river and entry, so that any boat that can get through the Lime-Kiln crossing will have no trouble in the canals.

A list of eight tugs of the Vessel Owners' Towing Co., Chicago, with particulars of hulls and machinery, has been issued by James L. Higgin, Jr., receiver, of No. 1 Franklin street, Chicago. These are the tugs that are to be sold Nov. 22, pursuant to an order of court.

Alexander Gillies, the lost captain of the Idaho, landed in New York in 1882. He was a native of Scotland, and shipped from Glasgow for the American shores. About seven years ago he went back to Scotland and was married in Glasgow, where his family were. He returned immediately after his marriage, and resumed his occupation on the lakes. His immediate family consisted of only his wife and himself.

James Davidson of West Bay City has gone into the wrecking business with the tug Swain, which has just been stationed at Detour. The Swain was generally overhauled at West Bay City and supplied with a new fitout of lines, hawsers, ropes, shovels, scoops, pick axes, cargo tubs, etc. She also has aboard two 14-inch rotary steam pumps, and is equipped with an electric lighting plant, including search light and arc lights.

Buoys on Lake Erie and in the lower part of the Detroit river will be taken up and replaced with winter buoys on or about the following dates: Those at Dunkirk, about Nov. 15; at Erie, including gas buoy, Nov. 18; Sandusky, and inland buoys, Nov. 20; Maumee bay, including gas buoy, Nov. 22; Detroit river, Dec. 1. The light-vessels at Ballard reef, Lime-Kiln crossing and Bar point will be left in position as late as circumstances will permit, probably between Dec. 5 and 10. The position of the latter vessel will be marked by a black buoy. Waverly shoal buoy and the buoys in Niagara river will be kept in position as late as the season will allow.

A Final Answer from Gen. Dumont.

It would seem that the correspondence between George L. McCurdy of Chicago and Supervising Inspector-General Dumont of the steamboat inspection service is to end with the letter printed herewith. This letter is in answer to one from Mr. McCurdy which appears elsewhere in this issue:

Geo. L. McCurdy, Esq., Royal Insurance Building, Chicago, Ill.—Sir: I am in receipt of your letter of the 3rd inst. in answer to letter from this office of the 27th ultimo, and have carefully considered its contents, and after doing so can find no reason to change the views expressed in the extract from my letter of the 27th ultimo, last paragraph as follows: "In view of the assumed fact that there are now on every lake steamer two 'unencumbered' copies of the rules of the board of supervising inspectors, and also two copies (unabridged) of the laws governing all steam vessels, including those on the lakes, accessible to the officers of such vessels, I do not feel warranted in complying with your request to furnish all masters and pilots individually with additional copies."

Treasury Department, Steamboat Inspection Service, Office of the Supervising Inspector-General, Washington, D. C., Oct. 27, 1897. Supervising Inspector-General.

JAMES A. DUMONT,

The Review is pleased to announce the marriage on Oct. 27 of Mr. James Warner Kellogg of the General Electric Co., Schenectady, N. Y., to Miss Louise Cook Pierce of New Bedford, Mass., daughter of Mr. Andrew G. Pierce of the Wamsutta mills. Mr. Kellogg is an honor graduate of Lehigh University, whose experience began in the engine works of the Allis Co. at Milwaukee. He entered the service of the Edison General Electric Co. as a draughting engineer. He has steadily risen until he is now in charge of that important branch of the General Electric Co.'s business devoted to marine and isolated plant work. He has had the supervision of the electrical equipment of almost all the vessels of the United States navy, and deservedly holds a high position in the esteem of his employers, comrades and business friends. We wish him all possible happiness in his new career.

Plea for Safeguards on Life-Boats.

Editor Marine Review:—I have read with much interest, mingled with profound sorrow and sincere regret, the newspaper accounts of the loss on Friday night last of the steamer Idaho above Long point on Lake Erie, and the heroism of the captain and crew of the steamer Mariposa in their endeavors to rescue the two survivors of that ill-fated vessel, who were found clinging to a spar in almost a hopeless condition. The rescue was a difficult task and the skill and good judgment displayed, which brought the Mariposa close enough to the spar in that terrible sea, so as to enable her crew to lift the two men aboard, cannot be too highly commended.

In many rescues that are made and get into public print one fact is very evident, and that is, that the sailor takes his life into his own hands with but one chance in ten of accomplishing the object desired. He never gives a thought as to whether he can or cannot get his boat unhooked after it is lowered, but jumps in and is lowered away irrespective of the consequences. All he knows or thinks about is to save the lives of his fellow beings. This is true heroism, and needs no comment, but who gets the benefit? Do the steamship owners, who should contribute the proper means to enable these heroes to save lives, at the peril of their own, receive a larger share, or does poor Jack? In almost every case is it not a fact that all the credit is claimed by the former? Yet I cannot see any reason why, as in the case of the Idaho I am almost thoroughly convinced that if she had been properly equipped with suitable life boats and a reliable releasing device that the chances are that some one or more lives might have been saved, because boats are more often swamped alongside in consequence of their tardy or total inability to be released than from their not being able to live in a bad sea. I say this without knowing what kind of equipments the Idaho had, but I do know that many steamship owners, with the approval of the board of supervising steamboat inspectors, cling to the old-fashioned wooden boats without air tanks, and the old stiff hooks, on account of their cheapness, the use of which to launch a boat in a heavy sea is sure death. If the Idaho was thus equipped the steamship owners and the steamboat inspection service are responsible for the loss and sacrifice of at least some, if not all, of these twenty-two lives on Friday night last. If I were satisfied that the best equipments and devices were exacted by the inspection service for the rescue and preservation of human lives, I would say nothing in this particular instance, on account of the sad results and the heroism displayed, but I see from accounts of every disaster lately occurred that more lives are lost from the want of these safeguards than from heavy seas.

New York, Nov. 9, 1897.

M. T. DOOLEY.

Plain Talk About the Inspection Service.

Editor Marine Review:—The letter of George L. McCurdy of Chicago, under date of Oct. 22, 1897, addressed to James A. Dumont, supervising inspector-general of steam vessels, published in the Review of Oct. 28, ult., calling attention to improvements that might be made in the steamboat inspection service, has voiced the sentiment that a large number of people interested in vessel property have for many years entertained, viz.: that our steam vessel inspection service has fallen far short of what it was intended to be, and what its importance demands that it should be. That instead of being a department of the government providing experts, skilled in the art of ship building and navigation, and competent to pass upon the qualifications of those who desire to be trusted with the lives and property of the public, it has degenerated into a mere asylum for incompetents. The criticisms of Mr. McCurdy on the "rules and regulations" of the board of supervising inspectors, were not only pertinent, but they only called attention to a few of the absurdities that have characterized the senile administration of the inspector-general's office for many years past.

The navigation of the great lakes with their connecting and tributary waters is governed by the act of congress approved Feb. 8, 1895. The rules of navigation prescribed by the "White law" are so explicit in detail that little or nothing further is required to make them complete, and the practical effect of the so-called "inspector's rules" is to render obscure what should be a simple matter. What need is there for rule 1 of the "inspector's rules" relating to the great lakes? Rule 17 of the "White law" in a few words states what is to be done in the situation described, and the inspectors have no power to modify or alter it, and their attempt at improvement has much the appearance of an itching desire to have the public understand that nothing relating to navigation is quite complete without the finishing touch of that highly ornate but somewhat antiquated head of the inspection department.

The necessity for inspector's rule 2 is not apparent. Rule 18 of the "White law" clearly defines the duty of vessels in the situation named, and was carefully prepared, evidently with the intention of leaving the vessel having the other on her starboard side free to adopt such measures to avoid the other as the exigencies of the case might require. The inspector's rule attempts to deprive the master or pilot of the discretion given him by rule 18 of the "White law." And so through nearly the whole chapter of "inspector's rules" is seen this disposition on the part of the board of inspectors to "tinker" with the rules of the "White law." It is a fair presumption that if these inspector's rules were necessary to safe navigation, congress would have embodied them in the "White law."

The disposition of the board to meddle with the rules of navigation is among the least of its offenses, serious as this is. The inspection of hulls is conducted in the most haphazard manner. The service has no rules for the construction of hulls, whether of iron, wood or steel, and does not require the material of metal vessels to be subjected to any test whatever before it enters into the construction of a ship. The service fails to provide in any manner for the installation of electric lighting, heating or power appliances on ship board, a subject that enters largely into modern ship building, the efficiency of which cuts no small figure as to the safety of the ship.

These and other criticisms that might be urged justify the assertion that the service is not up with the progress that has been made in modern ship building and marine engineering. Perhaps the most serious matter in connection with the whole inspection service is the disposition manifested by the head of the department, the inspector-general, to rid the service of competent inspectors. Without a scientific training himself,

either in ship building, navigation or marine engineering, his administration has been marked by the disposition to discourage the appointment or the retention of officers educated along lines in advance of his own ideas. There has been more than one instance where competent men have been driven from the service because they had the courage to suggest needed reforms, and incompetent nobodies substituted in their place; men without education or experience in the line of duty required.

It is criminal negligence to permit men who have absolutely no knowledge of ship construction to pass judgment upon the safety of hulls and boilers, and this is a matter of daily occurrence. A reform is needed in the method of conducting the trials of masters and pilots charged with offenses against the navigation laws. Under the present system a ship's officer is charged with a violation of a rule of navigation. Often he does not know who his accuser is. He is summoned to meet the local inspectors. He is not permitted to have assistance of counsel, or examine witnesses, and in this star-chamber proceeding his reputation as a master or a pilot is left to the tender mercies of men not always impartial and quite as often prejudiced against him.

The fact is, and plain speaking requires us to say, that the supervising inspector-general has long since outlived his usefulness, so far as this service is concerned. Modern ship building and modern methods have advanced while he and his board have stood still. The supervising general can do the country no greater service than by retiring to private life, and by surrendering to more experienced men the direction of affairs that have outgrown his grasp.

H. R. SPENCER.

Duluth, Nov. 9, 1897.

That Double Track Idea.

Since the idea of a double track for vessels on Lake Huron was sent out from Chicago and credited to Capt. James Dunham, the Review has heard from several vessel masters, who are inclined to the opinion that the prospective president of the Lake Carriers' Association was simply prompted by a desire to give a story to one of his friends on the Chicago newspapers. Most of the captains looked upon the double-track scheme as a joke, but one of them takes it seriously and presents an argument showing that in many respects it is impracticable.

"We have a double, triple and quadruple track now," he says, "on Lake Huron and on all the lakes, in fact, if we were disposed to follow them. But of what use would the light-houses, fog signals, etc., on which the government has spent thousands of dollars, be to any of the vessels excepting those using the inner course? Ships' courses are likely to vary from trip to trip. On one passage a vessel may make a good course, while on another, under similar circumstances, she will fetch far from her objective point, on account of deflection of compass, careless wheelmen, variable winds and other causes, not wholly to be detected or accurately adjusted by the master without guide from the shore. Consequently the captain figures on locating, as far as possible, every whistle, light-house or other fixed government mark, enabling him to prove up his course, as it were, and make a true and known departure for the next point ahead. In thick weather, although it is possible to determine the direction of a whistle, it is most difficult to tell the distance it is away. A whistle that will be brought to you clear and distinct at a distance of ten miles on one trip, may, through causes of weather, sound dull and confusing the following passage at three miles. Imagine a double-track system in use in such waters, during thick weather, as from Bois Blanc island to Point au Pelee, from Presque Isle to Manitou, or from Whitefish point into the 'Soo,' where a master must exercise about the same caution to keep his straight course in the center of channel, to find the narrow openings that confront him and to avoid dangerous ground on either side as if he were navigating the Sault river; and the finding of these openings from the open water end are equally difficult, without hampering the master as to what track he should use. In the clearest weather high winds will often cause the vessel man to seek either shore, and keep it as close as safety will allow, to protect his boat, cargo and crew from the fury of heavy waves. The fervent prayer of the lake vessel master of late is this: May the land navigators, of whom there are some two or three most active, render us the great service to keep from trying to reform a business of which they have proven themselves quite ignorant."

Detroit River Draft.

Under strong westerly winds on Saturday last the draft of water in the Detroit river at Ballard's reef was reduced to about 16 feet. Following are the gauge readings at Ballard's reef for the past week:

DATE.	DRAFT.	WIND.
Nov. 2, 6 p. m.	17 ft. 2 in.	N., strong.
" " midnight.	17 ft. 3 in.	N. N. W., strong.
Nov. 3, 6 a. m.	17 ft. 1 in.	N. N. W., light.
" " noon.	17 ft. 4 in.	W., light.
" " 6 p. m.	17 ft. 4 in.	S. W., light.
" " midnight.	17 ft. 4 in.	S. W., light.
Nov. 4, 6 a. m.	17 ft. 4 in.	S., strong.
" " noon.	17 ft. 3 in.	S., fresh.
" " 6 p. m.	17 ft. 6½ in.	S. S. E., fresh.
" " midnight.	17 ft. 3½ in.	S., fresh.
Nov. 5, 6 a. m.	17 ft. 6 in.	S. W., strong.
" " noon.	17 ft. 4 in.	S. W., strong.
" " 6 p. m.	17 ft. 2 in.	W., strong.
" " midnight.	16 ft. 3 in.	W., strong.
Nov. 6, 6 a. m.	16 ft. 1 in.	W., strong.
" " noon.	16 ft. 5 in.	N. W., strong.
" " 6 p. m.	16 ft. 9 in.	W., light.
" " midnight.	17 ft. 2 in.	N. W., light.
Nov. 7, 6 a. m.	17 ft. 4 in.	N. E., light.
" " noon.	17 ft. 3 in.	S. E., light.
" " 6 p. m.	17 ft. 3½ in.	S. E., light.
" " midnight.	17 ft. 6 in.	S. E., light.
Nov. 8, 6 a. m.	17 ft. 4 in.	Calm.
" " noon.	17 ft. 2 in.	N. W., light.
" " 6 p. m.	17 ft. 3 in.	Calm.
" " midnight.	17 ft. 8 in.	N. E., strong.
Nov. 9, 6 a. m.	18 ft. 2 in.	N. E., strong.
" " noon.	17 ft. 1 in.	N., strong.



DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio, by John M. Mulrooney and F. M. Barton.

SUBSCRIPTION—\$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, \$1.00. Advertising rates on application.

Entered at Cleveland Post Office as Second class Mail Matter.

The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,034.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels.....	1,792	924,630.51
Sailing vessels and barges.....	1,125	354,327.60
Canal boats.....	416	45,109.47
Total.....	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30, 1891.....	204	111,856.45
" " " 1892.....	169	45,968.98
" " " 1893.....	175	99,271.24
" " " 1894.....	106	41,984.61
" " " 1895.....	93	36,352.70
" " " 1896.....	117	108,782.38
Total.....	864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (From Official Reports of Canal Officers.)

	St. Mary's Falls Canals.			Suez Canal.		
	1896*	1895*	1894	1896	1895	1894
Number of vessel passages.....	18,615	17,956	14,491	3,409	3,434	3,352
Tonnage, net registered.....	17,249,418	16,806,781	13,110,366	8,560,284	8,448,383	8,039,175
Days of navigation.....	232	231	234	365	365	365

*1895 and 1896 figures include traffic of Canadian canal at Sault Ste. Marie.

A facsimile of the seal of the Great Lakes Register, in water colors and elegantly framed has just been received from Capt. F. D. Herriman, surveyor general, of Chicago. The design is typical of the commercial industries of the inland marine, both American and Canadian, as indicated by flags on either side of the shield. A combination star and crescent, which is also worked into the seal, is the symbol of the register and will be prefixed to all certificates of classification of vessels built to the rules and under the supervision of a surveyor for the register. Lake vessel owners who have not had an opportunity to look over the work that has been going on for about a year past in the Chicago office of this new register of lake ships have no idea of the thorough manner in which it is being carried out. It is understood that the construction rules for both steel and iron vessels are now practically completed and that inspection reports (hull and machinery) are in hand from about 75 per cent. of the lake fleet. The book will go into particulars of vessels even further than is the case with Lloyd's or the Bureau Veritas.

The following list of elevators, with storage capacity, will convey an idea of the grain handling facilities at Buffalo, where it will be possible next year to handle about three hundred million bushels of grain if the business of the lakes develops to that extent: Great Northern, 3,000,000 bushels; Eastern, 1,500,000; Niagara, 1,200,000; Electric, 1,000,000; Export, 1,000,000; Bennett, 800,000; Brown, 250,000; Buffalo Lake Shore Transfer, 90,000; City A, 600,000; City B, 800,000; C. J. Wells, 550,000; Coatsworth, 650,000; Connecting Terminal, 950,000; Dakota, 850,000; Erie Canal, 70,000; Evans, 400,000; Exchange, 500,000; Frontier, 650,000; National, 65,000; Husted, 75,000; International, 650,000; Kellogg, 600,000; Marine, 650,000; National and Globe Mills, 100,000; Erie, 720,000; Niagara A, 800,000; Niagara B, 1,200,000; Niagara C, 200,000; Ontario, 450,000; Queen City, A, B, C, 450,000; Richmond, 250,000.

Five of the seven freight steamers now building on the lakes are of steel and of the 6,000-ton class. All of the five steel steamers are to have quadruple expansion engines of 2,400 to 2,700 horse power, and three of them are to have water tube boilers (Babcock & Wilcox type). The adoption of water tube boilers in these big freight carriers is a matter of great importance to manufacturers of marine boilers throughout the country. "It means," says one of the leading ship owners of the lakes, "that within another year or two the water tube boiler will be applied to all new steel vessels of large type. It will be adopted with the quadruple expansion engine even more rapidly than the triple expansion engine was adopted. The disposition in the navy department to recommend water tube boilers for any big ships that may be authorized by the next congress will be a further incentive to this movement."

The people of Canada have burdened themselves with a bonded debt amounting to \$80 for each inhabitant in a resolute attempt to cut a way from the St. Lawrence to the Atlantic, and their efforts should be rewarded by a fair share of the immense export business that reaches the Atlantic seaboard by way of the lakes from the northwest, but it would seem that when their canals are completed they will be no better off than they are at present. Their 14-foot waterway, great as its advantages may be on account of avoiding the breaking of bulk at any point through to Montreal, is probably already discounted by ships of 7,000 net tons capacity

on the lakes, and by combinations in the grain business of this country that will control freight and elevator charges all the way from the grain fields to the Atlantic seaboard.

Several valuable communications appearing in these columns of late show that the men who build and manage ships are taking a deep interest in the subject of a United States merchant marine on the seas and are determined that the subject shall be fully considered at the next session of congress. Impressed with the immensity of British interests in ships and ship building, Mr. Frank J. Firth of Philadelphia, one of the vice presidents of the Lake Carriers' Association, sends the Review, upon his return from Europe, a communication on the shipping question, which appears elsewhere in this issue. "If the American people unite in agreeing what they want done," Mr. Firth says, "they may confidently be relied upon to find a way to do it."

In connection with the work on which the commissioners on the Nicaragua canal will have to report, attention is called to the reduction in cost which recent improvements in appliances for such enterprises have made. The Menocal estimate of cost for digging through the alluvial deposits on the canal route was 20 cents per cubic yard. During the last year digging of the same kind has been done in the Mississippi for 1 cent per yard, and 5 cents is counted a high price by competent men. The Menocal estimate for blasting out the underwater rocks, on the north side of the big lake, for instance, was \$5 per cubic yard, while the United States government is now paying but \$2.50 per cubic yard for harbor rock in the Niagara river.

The establishment of a department of commerce and industry is strongly urged in a letter sent to President McKinley by the National Business League, of which Ferdinand W. Peck of Chicago is the president. The function of the new department, as suggested by the business league, would be to gather information with a view to the systematic extension of commerce with South American and Central American states and other foreign countries, collecting and tabulating statistics regarding various industries and making reports and recommendations as a basis for intelligent action in the interest of such industries and their employees.

A note in a recent number of the Review about a pocket book for engineers and mechanics, with which the name of Chas. H. Haswell of New York has been connected for a great number of years, has attracted the attention of a correspondent, who is impressed with the fact that the work is now in its sixty-second edition. "I have one of the earlier editions," he says, "which I supposed was the first, as I have had it for a long time. I find, however, that it is the seventeenth edition, published in 1867."

"It's another case of the trolley car and horse car in street railway business," said an old-time vessel man while comparing a list of new steel ships with some of the wooden vessels of two or three years ago.

It took ten to twelve billion dollars to construct and equip the railway system of the United States, and yet the freight traffic of the great lakes is about one-third that of the railways.

The Nicaraguan canal commission will leave New York for Greytown harbor on the 17th inst., where surveys will be made of the canal termini.

Hon. Wm. T. Malster, president of the Columbian Iron Works & Dry Dock Co., has been elected mayor of Baltimore.

Over seventy-five per cent. of the enlisted men of the United States navy are now American citizens.

The Nova Scotia Ferry.

Editor Marine Review:—In one of your late editions you have a picture of the ferry boat Chebucto (the Indian name for Halifax harbor), built on the Clyde, and intended for service between Halifax and Dartmouth, Nova Scotia. In crossing the "Western ocean" this vessel experienced rough weather and put into the Azores (or Western islands), and I see by the Halifax papers that her builders, who agreed to deliver her, will not attempt to bring her the rest of the way until next June. Meanwhile, there is great need of a good boat on this harbor, which is only about one mile across, and not eight miles, as the English papers have it.

It does seem strange to me that the province of Nova Scotia, that raised such men as Donald Mackay, the Moseleys and the ship builders of Windsor and Maitland and other towns down in the "Bluenose" country, should send across the Atlantic for a ferry boat, but perhaps the reason is that the original ferry boats, built sixty years ago, had Scotch engines in them, and they never wore out. I believe they are running yet. Nova Scotians like things that last, but they could have built a boat themselves that would have answered every purpose.

Cleveland, Nov. 10, 1897.

W. A. CRICHTON.

Is Not a Bounty the Only Remedy?

Editor Marine Review:—Referring to Mr. Babcock's article on the protection of American shipping in your issue of the 4th inst., I do not quite understand how a retaliatory duty placed by Great Britain on food products imported in American bottoms would increase the cost of such products to the British workman, so long as there existed bottoms other than American prepared to carry the products free from duty. Is it not as difficult to protect American bottoms in foreign waters as to protect American cloth in foreign countries? In either case is not a bounty the only remedy? And is this bounty a part of Mr. Babcock's plan? If it is not, I do not see how he proposes to prevent American bottoms from traveling empty in one direction.

No. 25 Park Place, New York, Nov. 6, 1897.

JOHN H. PUGH.

Army and navy charts for the lakes are kept in stock by the Marine Review, Perry-Payne building, Cleveland.

Steamboat Inspection Service.

The two pages of correspondence between George L. McCurdy of Chicago and Inspector-General James A. Dumont of the steamboat service, which appeared in the last issue of the Review, were followed by another letter from Mr. McCurdy. This last letter contains some very plain criticism of the steamboat inspection service, which would indicate that Gen. Dumont's explanations have not been satisfactory to the Chicago insurance interests, and that another influence has probably been added to those already asking changes in methods attending the business of this branch of the treasury department. The letter is as follows:

Gen. James A. Dumont, Supervising Inspector-General, Washington, D. C.—Dear Sir: I am surprised and disappointed by your letter of Oct. 27. You concede having only distributed extracts of the law of 1895, instead of the complete statutory rules with your inspectors' rules, and you quote the statute to show that it contains no express mandate for you to publish and distribute the statute, and then seek refuge behind the claim that the law did not require you to do what I have complained of your not doing. You say that upon the passage of the law of 1895 your board made its rules "and incidentally, and not as a duty under the law, added to such regulations certain extracts from the law." If it was advisable to add "extracts from the law," and you had the authority to publish "extracts," you do not explain why the same authority would not permit you to give the navigator the benefit of the whole law on the subject.

If your duties are bounded by the strict mandates of the law, your publication of extracts was in excess of such duty, but since you have recognized a duty beyond the letter of the law and have published them, I hardly think that you should resent my suggestion that "incidentally, and not as a duty under the law," you circulate a simple copy of the "White law" and your rules explanatory thereof, and discontinue the circulation of a lot of rules not applicable to the lakes. These inapplicable rules, while more liable to introduce confusion, are otherwise of no more importance to lake navigators than would be your including a copy of the ancient laws of Oleron. While "incidentally" publishing and distributing so much that the law did not require of you, I cannot appreciate your omission of statutory rule 27, which I understand qualifies not only the statutory, but also the inspectors' rules, and which provides that, "in obeying and construing these rules due regard shall be had to all dangers of navigation and collision and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger."

As a representative of underwriters heavily interested, I maintain my right to complain of your arbitrarily omitting statutory rules and so publishing less than the whole. Further, aside from any disputed facts, I feel it my duty to complain of the patch-work circular which you concede having sent out with "extracts" of "all the laws," applicable and non-applicable, in force and superseded, in a sort of holus-bolus mass from which the navigator must choose at his peril and which he must supplement with such statutory rules as you did not "incidentally" include. To this criticism you seem to content yourself with the answer that "this office has no apologies to offer." I appealed to you for protection and not "apologies," and still believe that it is your official duty to see that this circular is superseded by a simple unincumbered notice to mariners of the law of 1895 with your rules thereunder.

Speaking of this circular of yours, you say that the board does not believe that any intelligent lake master was deceived thereby. In the first place, I cannot appreciate your right to speak of an "intelligent lake master" as though there were unintelligent ones when your department, through its local inspectors, has certified that each master of a lake steamer is a "skilful master" and "can be entrusted." Secondly, I do not think that we should be asked to rest content with your "belief" that masters are able to not only construe the rules, but also to sever the wheat from the chaff which you have given them. Your department has vouched for the skill and competence of the master and pilots of each lake steamer upon which we hold a risk, and therefore we appeal to you, from the following condition of affairs:

1. The masters of lake steamers who are required to navigate with respect to other vessels as well as to other dangers were in most instances licensed prior to 1895, and have ever since been sailing under renewals.

2. Since the law was changed in 1895 your local inspectors have each year been certifying that each of these masters "has given satisfactory evidence that he is a skilful master of lake steam vessels and can be entrusted to perform such duties," and yet from your own printed instructions given out with your circular of miscellaneous extracts in the spring of 1895, and since, you have given notice that it is not even necessary to appear before the board of local inspectors for renewals, and no examinations have been required where licenses have been renewed since the law was changed.

3. You concede never having seen or required that the masters even have a complete copy of the present law, and you yourself are responsible for their having notice of extracts of law which is not law for them.

It is possible that the custom offices would be able to furnish copies of the "White law" upon application, but your department is the one upon which navigators depend for their licenses, with which they are in close touch and to which they have always looked and now naturally look for their instructions. Your "belief" that they are not confused by the circular you sent does not answer, because it is well known that lawyers and courts have repeatedly differed as to the construction of such rules, and the courts have differed and are still at variance as to what law applied on the lakes between the time of the passage of the international rules and the approval of the act of 1895. No less an authority than Judge Coxe of New York state has treated the act of 1864 as a nullity on the lakes since 1865, and when you point masters to this act of 1864 by an extract in your circular, and at the same time omit to include or call attention to the repealing clause in the act of 1895, I consider that you have introduced an unwarranted confusion, which might mislead the most "intelligent" lake master.

Since our property is at stake in charge of masters certified by your department as trustworthy and skilful, and to have been examined and given evidence which they have not given to your department, it seemed to me that the least that you could do, in view of the foregoing, would be to comply with my request that a copy of the whole law and nothing but

the present law of the lakes be brought to the attention of lake masters in a clear and simple form.

Copies of the law might be furnished and distributed at great expense as a private enterprise, but aside from any consideration of expense, such matter might better come from you, and even if the law does not absolutely require your doing so, yet your acts in distributing the circular sent out would indicate that you had recognized an official duty along the very lines of the request I have made.

I am surprised that you should decline to comply with the request made and the more so since you base your declination upon a half truth to the effect that you have furnished vessels with "the laws governing all steam vessels" (from which the masters may choose), when you have conceded and your circular and posting cards show that the laws so furnished were incomplete. In view of the foregoing, I trust that your decision in this matter will be reconsidered.

Chicago, Nov. 3, 1897.

GEO. L. MCCURDY.

Again Only One Vessel Through the Suez.

In another report of Suez canal traffic, this time covering a period of six months, only one American vessel appears, a craft of 683 tons. The statement that follows is from the United States consular agent at Port Said, and relates to Suez canal traffic during the first six months of 1897:

Nationality	Number of ships.	Net tonnage	Traffic receipts.
British.	908	2,765,657.62	\$5,024,957
French.	101	254,915.46	485,367
Dutch.	106	194,506.10	364,797
German.	161	425,456.41	771,060
Italian.	39	66,114.23	132,110
Norwegian.	28	46,700.94	84,159
Russian.	19	61,854.52	141,480
Austrian.	37	89,764.92	160,557
Spanish.	27	80,129.46	158,875
Japanese.	18	46,101.88	84,507
Chinese.	2	2,597.11	4,692
Ottoman.	4	4,479.95	11,909
Egyptian.	3	3,401.27	7,057
Siamese.	1	1,279.99	2,382
United States.	1	683.56	1,230
Danish.	2	1,043.97	1,880
Mexican.	1	551.28	956
Total.	1,458	4,045,238.67	\$7,437,975

Water Tube Boilers for Large Naval Vessels.

It would seem from a short discussion of the water tube boiler question in the annual report of Commodore Melville of the bureau of steam navigation, that the next order for big ships from the navy department will provide for water tube boilers. After referring to the action of the department in installing coil boilers in the Monterey as far back as 1892, and their adoption quite generally in torpedo boats, Commodore Melville says that with experience now gained, the bureau feels that the efficiency of the fleet will be best served by using water tube boilers on future ships. "It would have been easy for this bureau to gain a cheap reputation for progressiveness," he adds, "by adopting, after successful trials with the Monterey, this type of boiler at once for all ships, but there had not been sufficient experience in extended cruising at sea to make such a step judicious, and with only three battleships in commission, we could not experiment on the few additional ones authorized."

It is plain, however, that the engineer-in-chief is still opposed to the Belleville boiler, so extensively adopted in France and England, as he says that the saving in weight due to its use has not been so great as seems desirable if the cylindrical boiler is to be definitely abandoned. It would seem also that he looks for a combination of the best features of several water tube boilers. On this score he says in concluding his summary of the subject:

"As yet it can certainly not be said that any one of the numerous varieties of water tube boilers is absolutely the best. Some of the ablest engineers in the world who, to cultivated talent add vast practical experience, have identified their names with particular forms of this type of boiler, and it is probable that, as experience accumulates, a form of boiler will be evolved embracing the best features of all of them. With respect to the form used on our recent ships—the Babcock & Wilcox—it may be said that it is a marine form of their well-known land boiler, which is used extensively all over the world, and which has all essential features in common with a number of other well-known land boilers, so that the fire room force of our ships is more likely to have some acquaintance with this boiler than others of the type. The straight tubes can be readily removed and replaced, and can be purchased wherever engineering materials are kept in stock. However, the bureau does not advocate any one form of boiler to the exclusion of the rest, but believes the best results will come from giving the contractors freedom of choice of a form of water tube boiler, subject to certain conditions of scantlings, general design and workmanship, which the bureau is prepared to lay down."

New Station.

The new Twenty-third street station of the Pennsylvania Lines in New York is fast becoming popular with Cleveland people. The new cab service inaugurated by this line, with only a nominal charge, is what the people long have wanted. The 1:40 p. m. train from Cleveland has through sleepers to New York without change, and diner serving supper. This express train also makes quick time to Pittsburg, Baltimore, Washington and Philadelphia. For rates and full information call at City Ticket Office, 149 Superior street, Cleveland.

If the wind comes before the rain, soon you can make sail again.
If the rain comes before the wind, furl your topsails snugly in.

Lake Superior Commerce.

In the last issue of the Review there was printed a telegraphic summary of Lake Superior commerce to Nov. 1, as indicated by reports from the canals at Sault Ste. Marie. The principal feature of this summary was a shortage of more than 500,000 tons in Lake Superior soft coal shipments to Nov. 1, as compared with the movement on the same date a year ago. The full canal report is now at hand, and as a matter of record the complete statistics are printed herewith:

	VESSEL PASSAGES.	REGISTERED TONS.	FREIGHT TONS.
To Nov. 1, 1897.....	15,355	15,788,994	15,629,382
To Nov. 1, 1896.....	17,053	15,787,927	14,539,968

MOVEMENT OF PRINCIPAL ITEMS OF FREIGHT TO AND FROM
LAKE SUPERIOR.

ITEMS.	To Nov. 1, 1897.	To Nov. 1, 1896.	To Nov. 1, 1895.
Coal, anthracite, net tons.....	444,258	349,929	354,414
Coal, bituminous, net tons.....	1,752,283	2,315,437	1,859,818
Iron ore, net tons.....	9,879,341	7,459,264	7,543,207
Wheat, bushels.....	41,284,034	52,107,888	28,900,614
Flour, barrels.....	7,145,141	6,841,632	7,236,732

REPORT OF FREIGHT AND PASSENGER TRAFFIC TO AND FROM LAKE
SUPERIOR, FROM OPENING OF NAVIGATION TO NOV. 1
OF EACH YEAR FOR THREE YEARS PAST.

EAST BOUND.

ITEMS.	Designation.	To Nov. 1, 1897.	To Nov. 1, 1896.	To Nov. 1, 1895.
Copper	Net tons....	107,612	106,038	94,251
Grain, other than wheat	Bushels.....	16,259,878	20,973,705	688,711
Building stone	Net tons....	6,249	17,194	22,835
Flour	Barrels.....	7,144,856	6,841,345	7,234,582
Iron Ore.....	Net tons....	9,879,341	7,459,264	7,543,207
Iron, pig.....	Net tons....	11,047	21,631	20,861
Lumber	M. ft. b. m.	715,529	631,982	695,875
Silver ore.....	Net tons....	5	240	100
Wheat.....	Bushels.....	41,284,034	52,107,888	28,900,614
Unclassified freight	Net tons....	198,606	157,357	129,704
Passengers.....	Number....	18,859	18,197	16,250

WEST BOUND.

Coal, anthracite.....	Net tons...	444,258	349,929	354,414
Coal, bituminous.....	Net tons ..	1,752,283	2,315,437	1,859,818
Flour	Barrels	275	287	2,150
Grain	Bushels	15,100	2,209	35,650
Manufactured iron.....	Net tons....	104,204	79,850	64,559
Salt	Barrels	210,397	205,636	218,908
Unclassified freight.....	Net tons....	308,177	285,464	264,631
Passengers	Number ...	20,617	18,503	16,818

SUMMARY OF TOTAL FREIGHT MOVEMENT IN TONS.

	To Nov. 1, 1897.	To Nov. 1, 1896.	To Nov. 1, 1895.
West bound freight of all kinds, net tons	2,350,282	3,067,519	2,527,768
East bound freight of all kinds, net tons	13,279,100	11,472,449	10,471,311
	15,629,382	14,539,968	12,999,079

The total number of vessel passages to Nov. 1, 1897, was 15,355 and the registered tonnage 15,788,994.

Stock of Grain at Lake Ports.

The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store in regular elevators at the principal points of accumulation on the lakes, Nov. 6, 1897:

	Wheat, bushels.	Corn, bushels.
Chicago.....	3,657,000	19,730,000
Duluth.....	2,548,000	735,000
Milwaukee.....	236,000	343,000
Detroit.....	327,000	59,000
Toledo.....	428,000	486,000
Buffalo.....	1,130,000	2,572,000
	8,326,000	23,925,000

As compared with a week ago, the above figures show, at the several points named, a decrease of 440,000 bushels of wheat and 696,000 bushels of corn. On the same date there was afloat on the lakes 1,971,000 bushels of wheat, 2,510,000 bushels of corn and 2,241,000 bushels of oats. Grain afloat on the canals aggregated 540,000 bushels of wheat, 301,000 bushels of corn and 140,000 bushels of oats.

Hunters' Excursion Rates—Parties of three or more may secure one-fare rates to designated local points on the line of the Nickel Plate road in western Ohio and Indiana; also single tickets will be sold to points in the northwest and southwest. No. 354, Nov. 15.

Winter Schedule on the Nickel Plate Road.

Commencing Sunday, Nov. 14, passenger trains will run as follows:
WEST BOUND.

No. 1. Leave Buffalo 12:40 noon; arrive Cleveland 7:30 p. m.; leave 7:50 p. m., arrive Ft. Wayne 2:40 a. m.; arrive Chicago 7:55 a. m. Time at stations east of Cleveland five minutes earlier than prior to Nov. 14.

No. 3. Leave Buffalo 11:45 p. m., as at present, and on same time at stations west to and including Ft. Wayne. At stations west of Ft. Wayne No. 3 will arrive a few minutes later than prior to Nov. 14, arriving Chicago 4:35 p. m.

No. 5. Leave Buffalo 5:35 a. m., same as before Nov. 14, and passes intermediate points, including arrival at Chicago, same time as before Nov. 14.

EAST BOUND.

No. 4. Leave Chicago 10:25 a. m., arrive Ft. Wayne 3:05 p. m., arrive Bellevue 6:25 p. m., arrive Cleveland 8:15 p. m. Depart from Cleveland 8:35 p. m., arrive Buffalo 1:35 a. m., arrive New York City 3:00 p. m., arrive Boston 5:25 p. m.

No. 6. Leave Chicago 2:00 p. m., arrive Ft. Wayne 7:10 p. m. Depart from Ft. Wayne 7:30 p. m., arrive Bellevue 11:35 p. m., arrive Cleveland 1:21 a. m., arrive Buffalo 6:50 a. m., New York 7:30 p. m., arrive Boston 10:30 p. m.

No. 2. Leave Chicago 10:15 p. m., and due at intermediate points east to Buffalo same as prior to Nov. 14; New York city, Boston and all points east at convenient hour the following morning.

The through car service will be maintained at the same high standard of efficiency as prior to Nov. 14, with an advantage to passengers on train No. 6, which will afford through sleeping car accommodations to New York city and Boston, reaching Boston 10:30 p. m., following evening. The standard of our dining car service will be maintained to that same efficiency as has characterized our past service.

Solid through trains with uniformed colored porters in attendance upon all coach passengers. No. 388, Nov. 18.

OFFICE OF LIGHT-HOUSE ENGINEER,
9th and 11th Districts, Detroit, Mich.
October 27, 1897. Sealed proposals will be received at this office until 12 M. of Wednesday, the 24th day of November, 1897, for furnishing two (2) Third Order Lanterns for Sturgeon Bay Canal, Wis., and Devils Island, Wis., Light Stations. Plans, specifications, forms of proposal, and other information, may be obtained on application to this office. The right is reserved to reject any or all bids, and to waive any defects. M. B. ADAMS, Major, corps of Engineers, U. S. A., Light-House Engineer.
Nov. 11.

THE BARGE MANITOWOC

will be sold at auction at the foot of Concord Avenue, Detroit, Mich., Tuesday, November 16, at 10 A. M. Carries 650,000 feet of lumber or 1,100 tons of coal. Class A 2.

For Sale
STEAMER AND TWO CONSORTS.

Combined capacity 6000 tons iron ore on 17 feet draft. All in fine condition, being practically new. Can be purchased at low price and on easy terms. Tow suitable for lumber.

For information write,

MARINE REVIEW,

409 Perry Payne Bldg.
Cleveland.

\$350.00 WILL BUY

Two Propeller Engines 12x14 with Slide Valves, Cranks and all connections complete; three Propeller Wheels, 65 inches in diameter, 60 feet of 4-inch Shafting with Couplings and Cranks.

E. W. DURANT, Stillwater, Minnesota.

Nov. 18.

The Entire Fleet of Tugs of the
Vessel Owners' Towing Co. are
to be Sold

By order of the Circuit Court of Cook County, Illinois. Bids for all or any of these tugs will be received by the Receiver until 9:00 A. M., November 22, 1897; all bids to be accompanied by a deposit of 10 per cent. of the amount bid. The tugs can be seen by applying to the Receiver.

J. L. HIGGIE, Jr., Receiver,

NOV. 12.

Room 63, No. 99 Randolph St., CHICAGO, ILL.

The Bessemer Steamship Company

Solicits Catalogues, Prices and Discounts from manufacturers and wholesale dealers in Ship Machinery, Brass Goods, Rope, Paints, Asbestos, Packing, Hose, Furniture, Piping, Glass and Crockery, Tinware, Ranges, Carpeting, Bedding, Life-preservers, Rafts and Boats, Engineers' Supplies and Tools, Carpenters' Tools, Electric Supplies, Lamps, Grate Bars, Castings, etc., etc., etc.

ALSO QUOTATIONS from Market men and Grocers on the Lakes for Provisions and Meat, best quality only.

CATALOGUES without quotations are not wanted.

ALL GOODS except provisions to be delivered in Cleveland.

Address L. M. BOWERS, General Manager,
CLEVELAND, OHIO.

Chas. E. & W. F. Peck,

58 William St.
NEW YORK CITY.

812 Royal Insurance Building.
CHICAGO, ILL.

C. T. BOWRING & CO.,
5 & 6 Billiter Ave., E. C.
LONDON, ENG.

INSURANCE.

BROWN & CO.,
202 Main St.,
Buffalo, N. Y.

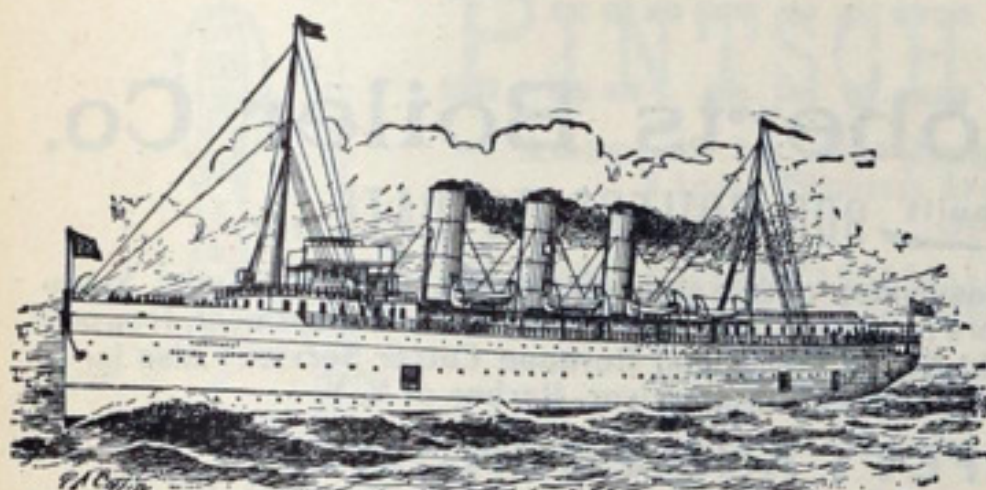
J. G. KEITH & CO.,
138 Rialto Bldg.,
Chicago, Ill.

LA SALLE & CO.,
Board of Trade Bldg.,
Duluth, Minn.

Are prepared to make rates on all classes of Marine Insurance on the great lakes, both CARGOES and HULLS.

"GREAT LAKES REGISTER."

F. D. HERRIMAN, Surveyor-General, Chicago, Ill.



Shippers of Coal by Rail and Water.

RAPID FUELING DOCKS, DETROIT RIVER.

JAMES GRAHAM & CO.,

Foot Twenty-first St., Detroit,

Below Routes of Passenger and Car Ferry Lines.

Pockets and Chutes arranged for different types of vessels.

BEST STEAM COAL.

Large Supplies and every effort to give dispatch, day and night. Wide stretch of river for tows, and plenty of water at dock at all times.

Office 1005 Chamber of Commerce. Phone 2083.

JOHN GORDON.

J. H. KELLERAN.

H. L. CHAMBERLIN.

JOHN GORDON & CO.

VESSEL, FREIGHT AND INSURANCE AGENTS,

1132 Guaranty Building,

BUFFALO, N. Y.

Newport News Shipbuilding & Dry Dock COMPANY.

WORKS AT NEWPORT NEWS, VA.

(On Hampton Roads.)

Equipped with a Simpson's Basin Dry Dock capable of docking a vessel 600 feet long, drawing 25 feet of water, at any stage of the tide. Repairs made promptly and at reasonable rates.

SHIP AND ENGINE BUILDERS.

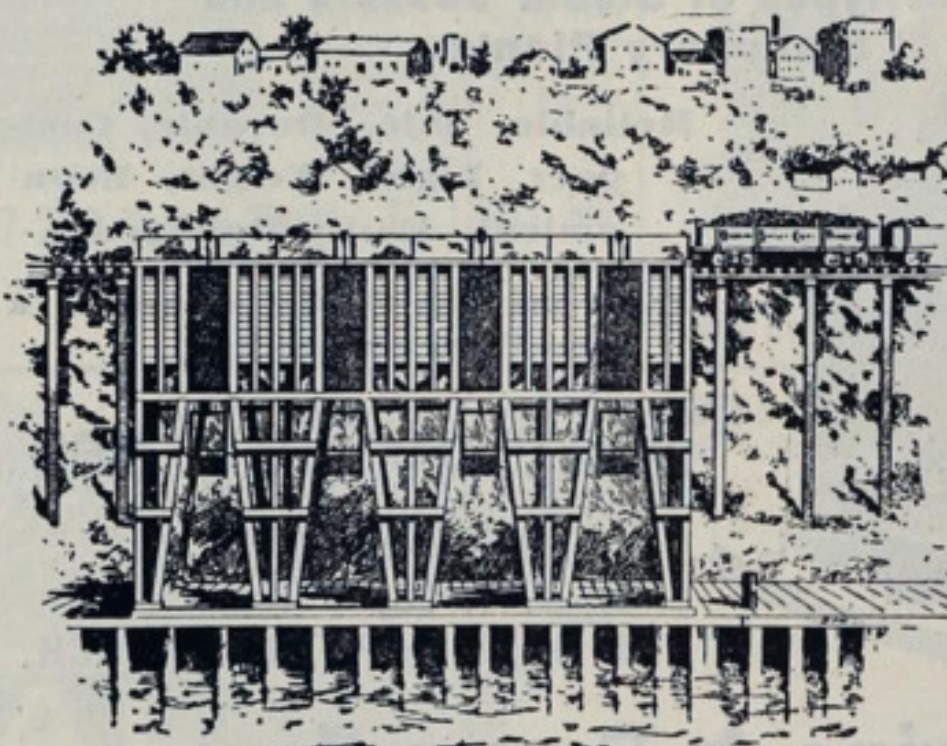
For estimates and further particulars, address

C. B. ORCUTT, Pres't,

No. 1 Broadway. New York.

FUEL DOCKS OF OSBORNE, SAEGER & CO.

Cuyahoga River, just above Superior St. Viaduct, Cleveland, O



Best
Youghiogheny
Steam Coal
Furnished
Day or Night.
No delay as
Elevated
Pockets
are used.

Telephone 1106.

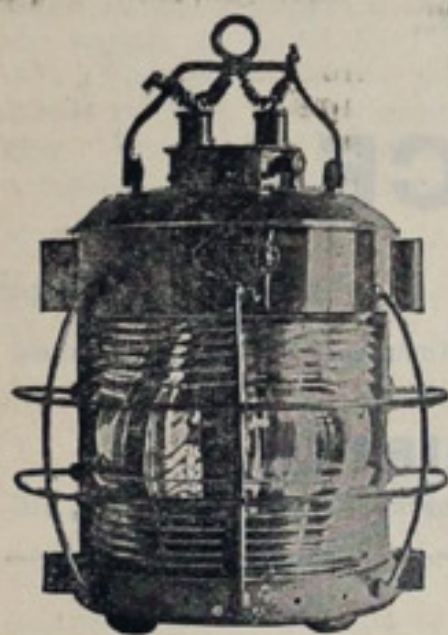
THE GLOBE IRON WORKS COMPANY, CLEVELAND, O.

SOLE MANUFACTURERS AND AGENTS FOR THE GREAT LAKES

THE PRICE PAID FOR CARRYING ORE during the past few months of this season was so near the COST OF CARRYING IT, that in order to keep even, every economy that was thought of was practiced. One means of economy was neglected in nearly every case. That was the possibility of reducing fuel consumption. This can be done by equipping your steamer with the Ellis & Eaves induced draft and Serve's ribbed tubes.

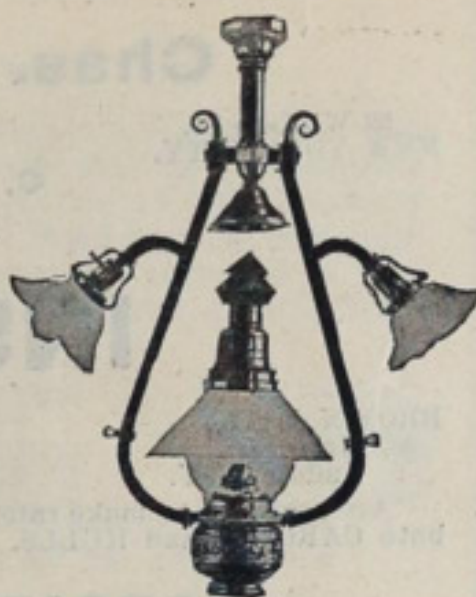
THE GLOBE IRON WORKS COMPANY, Cleveland, O., manufacturers for the Great Lakes.

MARINE LAMPS



Oil and Electric
Equipment for
Steamships,
Yachts, etc.

Signal Lights,
Saloon Fixtures,
Cabin Lamps,
Lanterns, etc.



Wm. Porter's Sons,
271 Pearl St., NEW YORK CITY.

INCORPORATED 1794.

Insurance Company of North America.

CAPITAL, Paid up in Cash, - - - \$3,000,000.00
ASSETS, 9,686,808.08

CHARLES PLATT, President.
EUGENE L. ELLISON, Vice-President.

GREVILLE E. FRYER, Sec'y. & Treas.
T. HOWARD WRIGHT, Marine Sec'y.

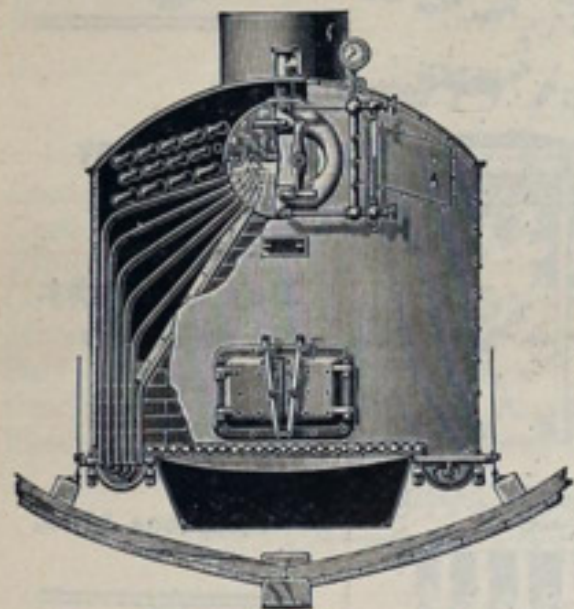
JOHN H. ATWOOD, Assistant Secretary.

Lake Marine Department.

GEORGE L. McCURDY, Manager
CHICAGO, ILLS.

SEABURY'S Safety Water Tube Boiler

For all types of Steam Vessels and
Stationary Plants.



Reliable, Safe, Durable, Com-
pact, Light Weight, Econ-
omical, Easily Managed.

Tubes may be readily cleaned, in-
ternally or externally.

Marine Engines,

STEAM and SAIL
YACHTS,
THE ONLY NAPHTHA LAUNCH.

Gas Engine & Power Co. and
Charles L. Seabury & Co. Consolidated.
MORRIS HEIGHTS, NEW YORK CITY.

G. H. FOSTER, Prest. MARK H. HANLON, V.-Prest. & Secy. W. H. WARNER, Treas.
DAVID BARNHISEL, Gen'l Mgr.

The Inter-Ocean Coal & Coke Co.

General office, 513 Perry-Payne Bldg., Cleveland.

PRODUCERS AND SHIPPERS.

Choicest Grades of YIOUGHIOGHENY COAL FOR STEAMBOAT FUEL.

Lighter in Cleveland Harbor of 400 tons capacity.

CLEVELAND DOCKS, just north of Main Street bridge.

SAULT RIVER DOCK at Sault Ste Marie, ¼ mile below the locks.

The Roberts Boiler Co.

Have built about 900 BOILERS TO DATE for

Launches, Yachts, Passenger and Freight Steamers, Dredges, Tugs, Stern-
Whealers, Canalers; also for Navy Department, War Department, Treasury
Department, Light-House Board and Revenue Cutter Service; also for N.
Y. Dock Department and U. S. Supervisor, Harbor of N. Y.

SAFETY AND ECONOMY.

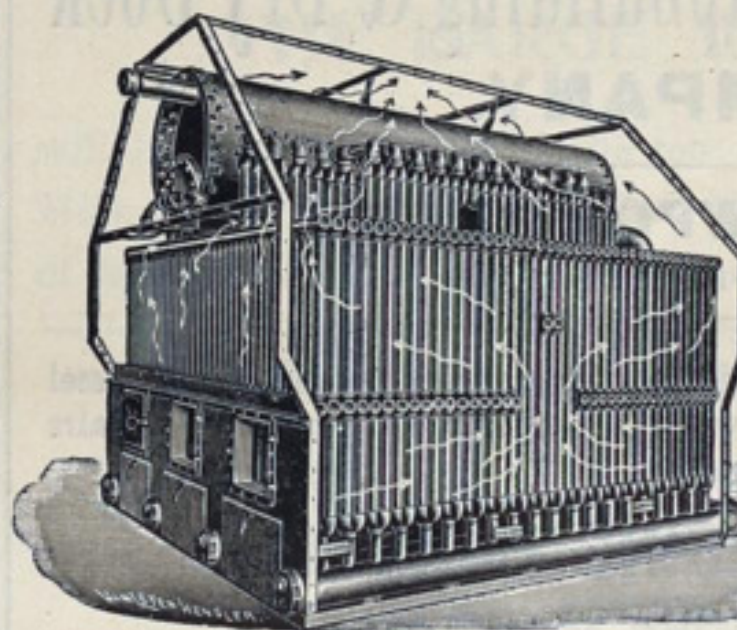
Never killed a man or had a serious accident. \$250,000 capital. Works
covering 29,000 square feet of ground. Never had a boiler returned on account of dis-
satisfaction. Every Boiler Warranted. All material made specially for our use. All
boilers tested at 500 pounds hydrostatic pressure and 250 pounds of steam before ship-
ping. Workmanship strictly first-class. All joints screwed and reliable. No expanded
joints. State your requirements and we will furnish specifications. Correspondence
solicited.

THE ROBERTS SAFETY WATER TUBE BOILER CO.,

39 and 41 Cortlandt Street, New York City.

Works, Red Bank, N. J.

TAYLOR PATENT UPRIGHT WATER TUBE BOILER.



Chief Engineer Skelton of
Steam Yacht Enquirer writes:
"I can honestly say, that the Tay-
lor boiler is the best boiler I ever
handled, and I have been in the
business 18 years. It is light
on fuel, carries steady water line
and steam is dry. You can refer
any person to me wishing to in-
quire into the merits of the Tay-
lor boiler, for she is a dandy."

(Signed) WILLIAM SKELTON, Jr.
The Taylor boiler is in the
three fastest boats of their re-
spective classes on fresh water,
viz., Yacht Enquirer of Buffalo.
W. J. Connors owner; in a 29½
miles race with Say When made
18.78 miles per hour; Yacht
Azalia, late Edward Henkel
owner, in a race with the fast
Side-Wheel Steamer Frank E.
Kirby, 1896, made 18 miles per
hour; Launch Dream, 63 feet
long, 9 feet beam, with only 350 square feet heating surface, makes 17 miles per hour.

MANUFACTURED BY

DETROIT SCREW WORKS, DETROIT, MICH. U.S.A.

ROBERT CURR, SURVEYOR OF IRON & STEEL HULLS,
Plans and Specifications furnished.

409 Perry-Payne Bldg.

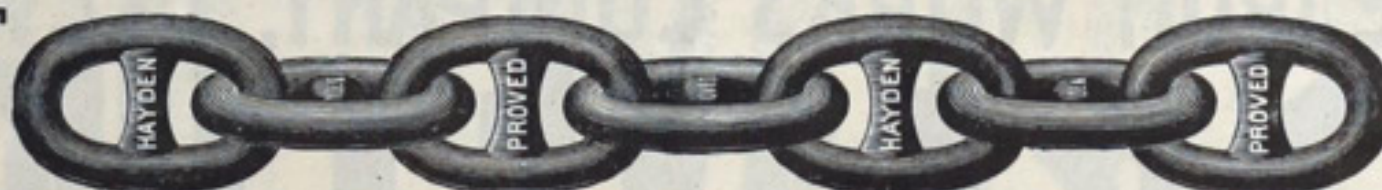
Telephone 472.

CLEVELAND, O.

Chain Department * P. HAYDEN S. H. CO. * Columbus, Ohio.

Our Chain in use on the Largest Steamers on
the Lakes:

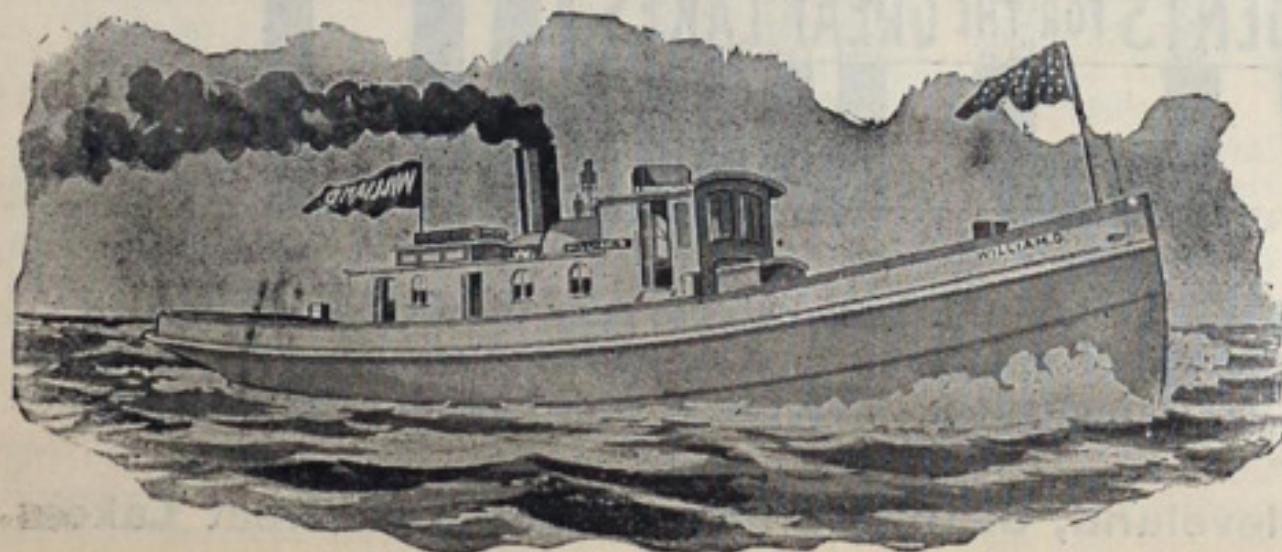
The Zenith City, Victory,
North West and North Land,
and many others.



All kinds of Chain—

Stud and Close Link,
Cable Chains.

Write for Prices.



C. E. GROVER, Prest.
D. R. HANNA, V. Prest.

W. A. COLLIER, Sec. & Treas.
CAPT. PHILIP SHIED, Marine Supt

The Ashtabula Tug Co.

Incorporated.

W. A. COLLIER, Gen. Mgr.

MAIN ST. BRIDGE,

CLEVELAND, O.

CLEVELAND, Tel. 409.

ASHTABULA, Tel. 149.

CHICAGO. BARRY BROS. Independent Tug Line.

TUGS

Rita McDonald, Wm. Dickinson,
Crawford, W. H. Wolf,
C. M. Charnley, Welcome,
D. P. Hall, Commodore,
Ira O. Smith, Jack Barry.

Office, 240 South Water Street,
Telephone Main 273.
3 long whistles call our tugs.

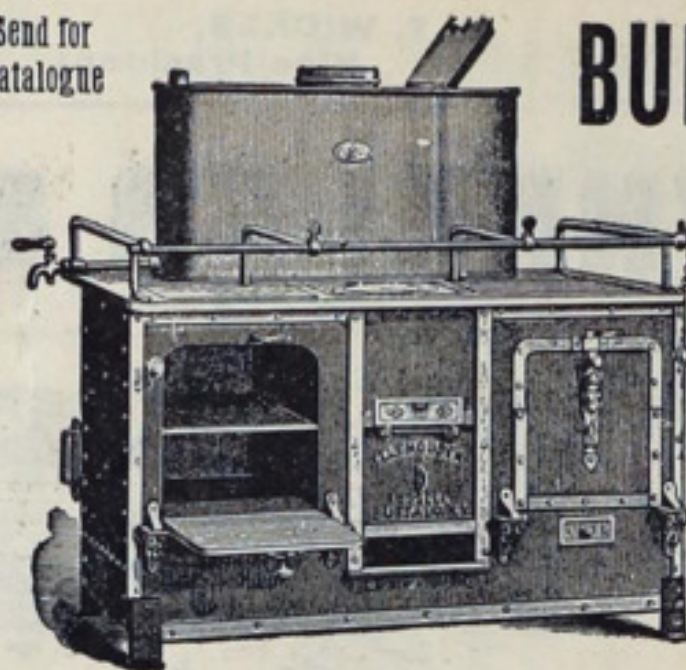
DULUTH. BARRY Towing & Wrecking Co.

TUGS.

G. A. Tomlinson, Industry,
Violet H. Raber, Prodigy.

Office, foot of 5th Ave., West.
Telephone 544.
3 long whistles call our tugs.

Send for
Catalogue



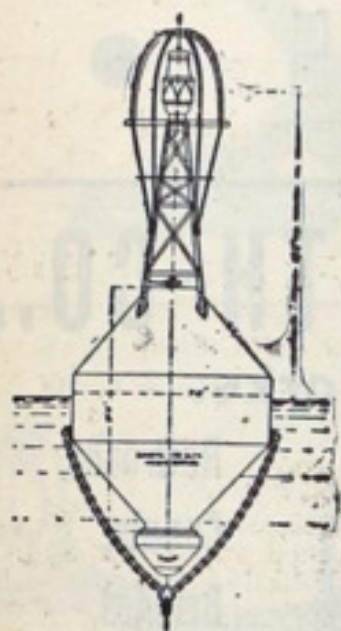
BUFFALO WROUGHT STEEL RANGES

Steamboat and Vessel
Ranges and Boilers,
with patent Rotary
Grate.

SOMETHING NEW AND GOOD.
We also carry the STAMFORD TUG
AND YACHT GALLEY STOVES.

RUSSELL & WATSON

Successors to Felthousen & Russell.
145 Main St., BUFFALO, N. Y.



PINTSCH GAS LIGHTED BUOYS

Adopted by the English, German, French, Russian, Italian, and United States
Light House Departments, for Channel and Harbor Lighting; over
500 gas buoys and gas beacons in service.

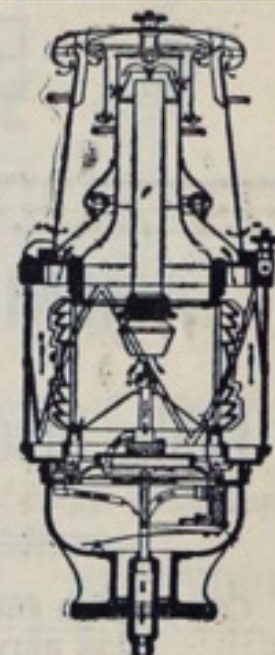
BURN CONTINUOUSLY from 80 to 365 days and nights without attention, and can be seen a
distance of six miles.

Brilliant and Steady Illumination. Economical and Reliable in Operation.

CONTROLLED BY THE

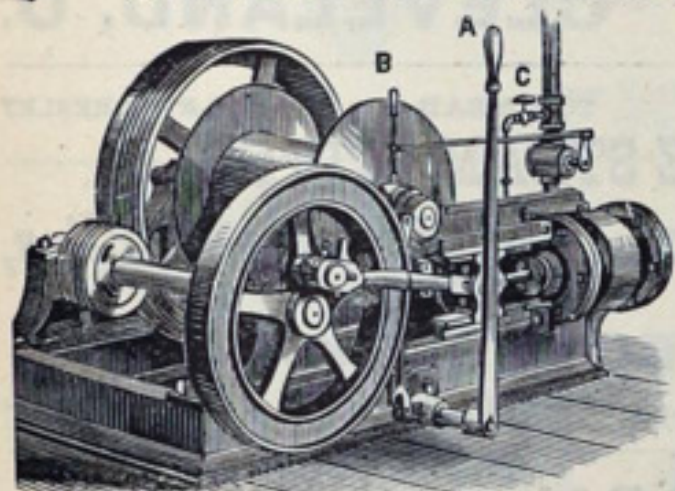
Safety Car Heating & Lighting Company,

160 BROADWAY, NEW YORK CITY.



WILLIAMSON BROS.

Cor. Richmond and York Sts., PHILADELPHIA, PA.



Hoisting Engines and Ship Steering Engines.

With either Frictional Spur or Worm
Gear of various Patterns to
suit all purposes.

Over 150 of the largest and most
modern lake steamers have
our steerers.

American Boat Building Co. Incorporated.

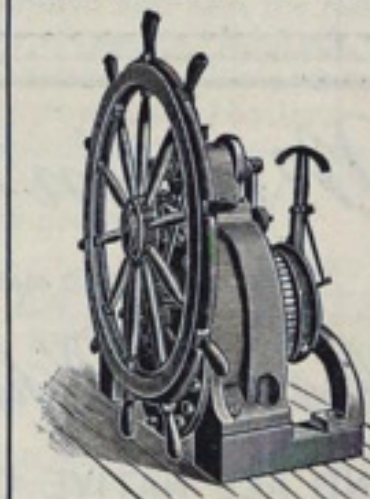


35x7 foot Launch Frame.

Knock-Down Boats,
something new. We do
the work, you nail
together. Freight low,
prices reasonable. Also
completed Boats, Half-
Raters, Knock-Aabouts
and Canoes. Send stamp
for catalogue.

3517-21 S. Second Street, ST. LOUIS, MO.

Queen City Hydraulic Steerer.



Best and
Most Powerful
Steerer

FOR TUGS,
STEAMERS,
ETC.

Price—From
\$650 to \$750, ac-
cording to size
and location in
steamer.

Manufactured
by

QUEEN CITY ENGINEERING CO., Buffalo, N. Y.

C. S. Richardson Fueling Co.

FUELING DOCKS:
NORTH PIER
18th STREET BRIDGE.
ILLINOIS CENTRAL SLIP 'C'

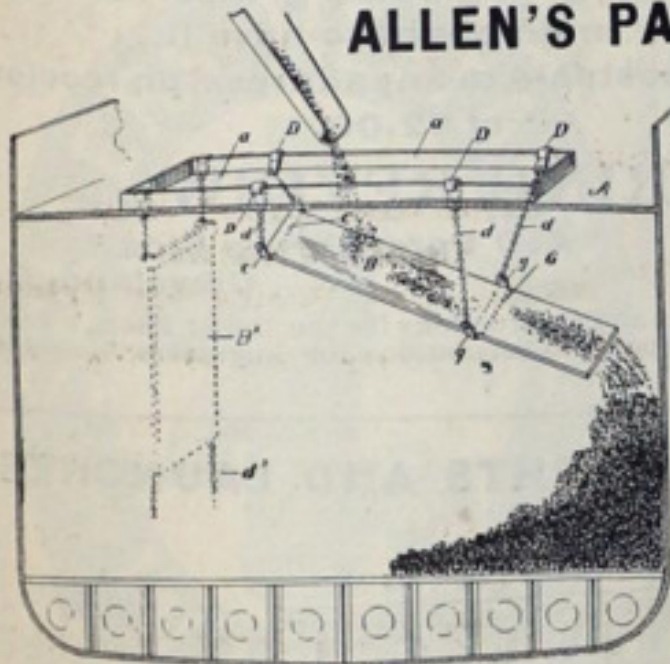
STORAGE DOCKS FOR ANTHRACITE:
KINGSBURY ST. BETWEEN INDIANA & ERIE STS.
ELSTON AVE. DIVISION ST. BRIDGE (NORTH BRANCH)
NORTH AVE. BRIDGE.
DIVISION ST. BRIDGE (OGDEN CANAL)
SOUTH HALSTED ST. BRIDGE.

COAL

OFFICE,
225 DEARBORN ST.

CHICAGO.

ALLEN'S PATENT TRIMMING GEAR.



Now used successfully on
Steamer Castalia and other
large Lake craft.

Time saved in trimming
on Cargo, also in unload-
ing. For particulars

address

or Capt. C. C. Allen,
Charles T. Pratt,
AGENT.

301 Perry-Payne Bldg.,
CLEVELAND, OHIO.

JOHN HAUG,

Consulting Engineer and Naval Architect.

Ship and Engineer Surveyor Lloyds Register, London.
Plans, Specifications and Superintendence of Ships and their Machinery.
specialties—Bulk Oil Vessels High Speed Yacht Engines, etc.

206 Walnut
Place,
Philadelphia.

P. M. CHURCH & CO., SAVINGS BANK BLOCK, SAULT STE. MARIE, MICH.

LEADING DEALERS IN

Ship Chandlery,

Marine Hardware, Paints, Oils, Packings, Cordage, Etc.

FIRST-CLASS COPPERSMITH AND TINSHOP IN CONNECTION.

The Chase Machine Co.

111 Elm St., Cleveland, O.

MACHINISTS and ENGINEERS

MANUFACTURERS OF
Land and Marine Engines
and Steam Pumps.

SOLE OWNERS AND MANUFACTURERS OF
Chase Fog Whistle Machine.

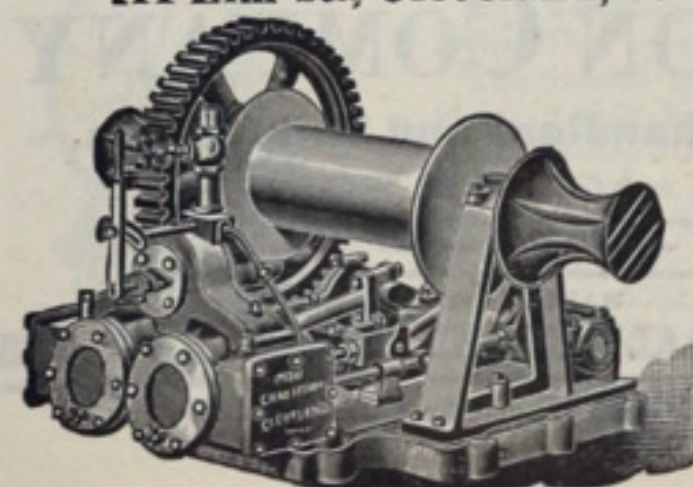
Over 150 in use on the best class
of Lake Steamers.

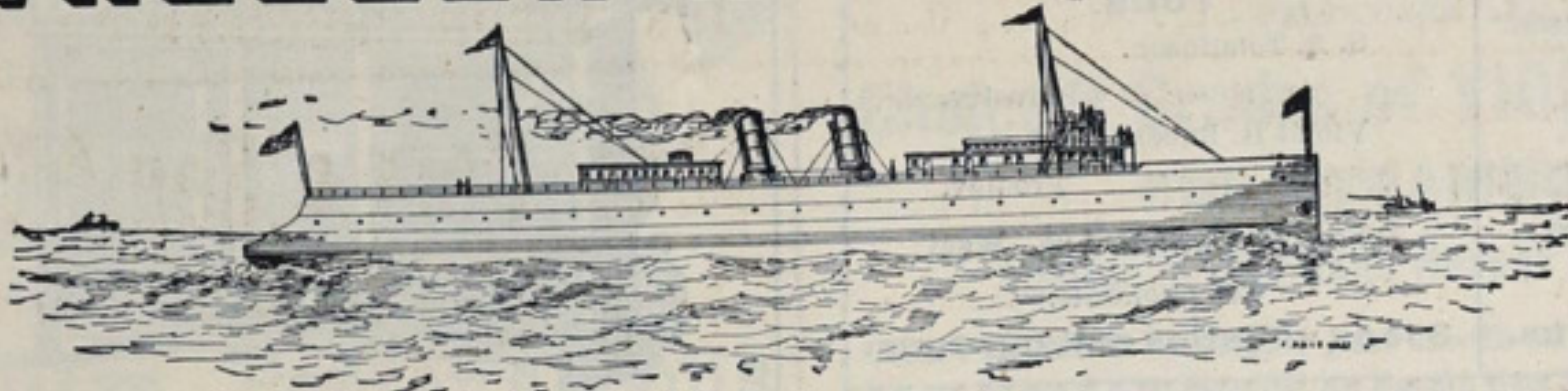
Special Attention given to

MARINE REPAIR WORK.

Engineers' Supplies,
Asbestos Pipe and Boiler Covering.

TELEPHONE 994.



F. W. WHEELER,
President.H. T. WICKES,
Vice-President.C. W. STIVER,
Secretary.JNO. S. PORTER,
Treasurer.**F. W. WHEELER & CO., WEST BAY CITY, MICH.**

F. & P. M. CAR FERRY.

● Builders of all kinds of METAL AND WOODEN SHIPS. ●

AMERICAN CHAIN CABLE WORKS.

ESTABLISHED 1865.

Cable, Dredge, Quarry, Shipping, Crane and Rafting

CHAINS.

Our Dredge and Crane Chains are made of Iron Rolled Specially for that purpose in three qualities, "Burden's," "H. B. & S." iron, and "Burden's Best Best" iron.

THE J. B. CARR COMPANY, TROY, NEW YORK.

The Martin-Barriss Co.

IMPORTERS AND MANUFACTURERS OF

Mahogany, White Mahogany,

AND ALL NATIVE CABINET WOODS.

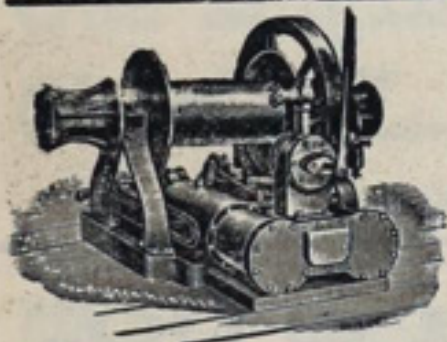
HIGH GRADES OF KILN DRIED WOODS FOR CABIN WORK AND INSIDE TRIM.

White Oak Timbers and Plank

CONSTANTLY ON HAND AND SAWED TO ORDER ON SHORT NOTICE.

654 Seneca Street,

Cleveland, Ohio.

**DOCK and DECK HOISTS**
ALL KINDS OF*Machinery & Friction Hoists.*

SEND FOR PRICES AND CIRCULARS.

JACKSON & CHURCH,
SAGINAW, MICH.**HOWARD H. BAKER & Co.****Ship Chandlers and Sail Makers,**

18 to 26 Terrace. — BUFFALO, N.Y.

H. CHANNON COMPANY

Ship Chandlers and Sail Makers.

AGENTS FOR

RYLANDS BROS.

MANUFACTURERS OF

ENGLISH GALVANIZED STEEL HAWSERS,

94-26 Market Street, CHICAGO, ILL.

**THE L. P. & J. A. SMITH CO.,**

Contractors of Public Works.

Dredging,
Pile-Driving,
Breakwaters,
Dry Docks and
Pier Building,Railroads,
Canals,
Bridges,
Foundations
Etc., etc.

23 River St.,

CLEVELAND, O.



H. E. STEVENS.

TOM MEAD.

LEW PRESLEY

BUCKEYE STEAM FITTING CO.*Steam Fitters, Engineers Supplies,*

Phone 4058.

AGENTS FOR

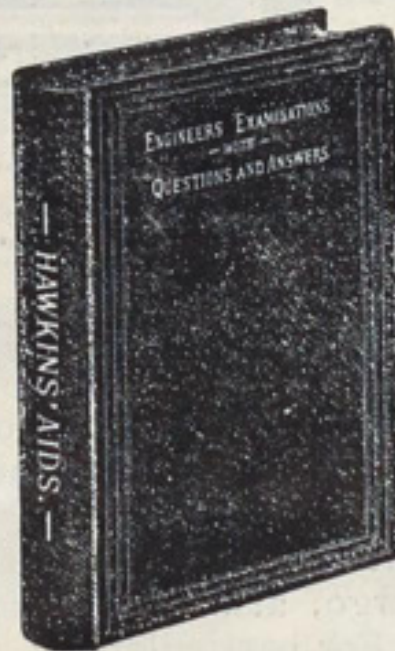
RAINBOW PACKING.

Open Day and Night.

117 River St., CLEVELAND, O.

THOS. DREIN & SON, TATNALL AND RAILROAD STS., WILMINGTON, DEL.

Builders of Metallic Life Boats and Rafts, Yachts and Pleasure Boats, Life Preservers. Outfit for Lake Steamers a Specialty.

**"Engineers' Examinations"**
With Questions and Answers.

Printed on heavy paper and bound in red leather.

Any young engineer, greaser or fireman ought to have it.

Sent postpaid to any address, on receipt of \$2.00.

MARINE REVIEW,410 Perry-Payne Bldg.,
Cleveland, O."Maxims and Instructions for the Boiler Room," \$2.50
"Hand-Book of Calculations for Engineers," 2.50**ALL KINDS OF BOATS, YACHTS AND LAUNCHES**Frames set up, MARKED AND SHIPPED KNOCKDOWN to any part of the world.
Send 50 cents for "ALBUM OF DESIGNS"; 72 Pages, 43 Subjects, 66 Designs.

Address Station A.

FRED W. MARTIN, Yacht Designer,
NORTH CHICAGO ILL. (Formerly of Racine, Wis.)

DIXON'S Graphite Pipe Joint Compound

Enables you to **MAKE A TIGHTER JOINT** than you can possibly make with red lead. You can do it easier, and parts can be separated at any time without breaking anything. Send for sample and circular.

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

Fred'k Baldt, President.

W. M. Gelston, Vice-President
W. S. Bickley, Sec'y and Treas.

Baldt Patent Stockless Anchor.

Made of the finest quality of open-hearth steel and constructed on the ball and socket principle.

Many points of superiority over ordinary Stockless Anchors.

BALDT ANCHOR COMPANY,
CHESTER, PA.

WALTER MILLER, Western Reserve Bldg.,
Cleveland, Ohio,

Representative for the Great Lakes.

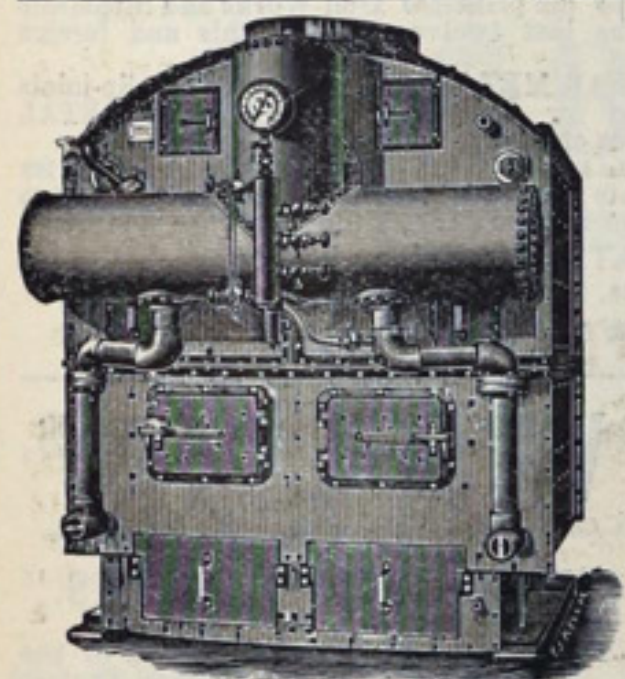
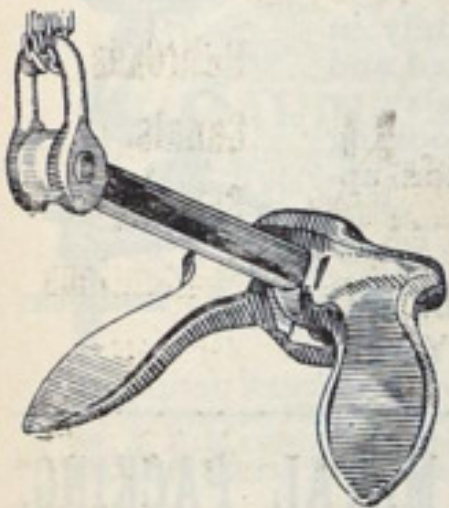
New catalogue containing valuable tables sent on application.

**Bement, Miles & Company,**
PHILADELPHIA, PA.
MANUFACTURERS OF**Metal Working Machine Tools**

For Ship Yards, Railroad Shops,
Locomotive and Car Builders,
Machine Shops, Rolling Mills,
Steam Forges, Boiler Shops,
Bridge Works, etc., etc.

**Steam Hammers, Steam and
Hydraulic Riveting Machines.**

New York Office: Taylor Bldg. No. 39 Cortlandt St.
Chicago Office: 1534 Marquette Building.

**ALMY'S PATENT
SECTIONAL****Water-Tube Boilers.**

NOW USED IN

12 Passenger Boats from 70 to 160 feet long.
27 Steam Yachts from 50 to 160 feet long.
U. S. Torpedo Boat "Stiletto."

Numerous Small Launches and Stationary
Boilers are giving most excellent results.

ALMY WATER-TUBE BOILER CO.,

No. 178-184 Allens Avenue,
near Rhodes St.

PROVIDENCE, R. I.

VANDUZEN Steam JET PUMPS

THE BEST IN THE WORLD.

Pumps any kind of Liquid. Always in order.
Never clogs nor freezes. Fully Guaranteed.
COST \$7 AND UPWARD. Especially useful for
Mines, Quarries, Pits, Wells, Clay Pits, Breweries,
on Steamships, Ferryboats, Sugar Plantations, etc.
A full stock always on hand.

Descriptive Catalogue and Prices furnished Free. **THE E. W. VAN DUZEN CO.,**
Cincinnati, O.

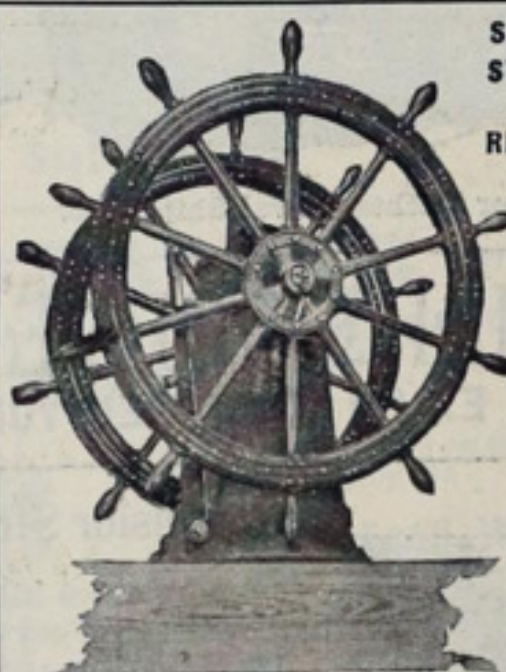
LONG LIFTS **HOT WATER**

SELLERS' RESTARTING INJECTOR

WIDE RANGE **LONG SERVICE**

SIMPLEST AND BEST

For Stationary, Portable, Traction Engines, Tugboats, &c.
Thoroughly Reliable—Perfectly Automatic.
JENKINS BROS., - Selling Agents,
NEW YORK, BOSTON, PHILA., CHICAGO.

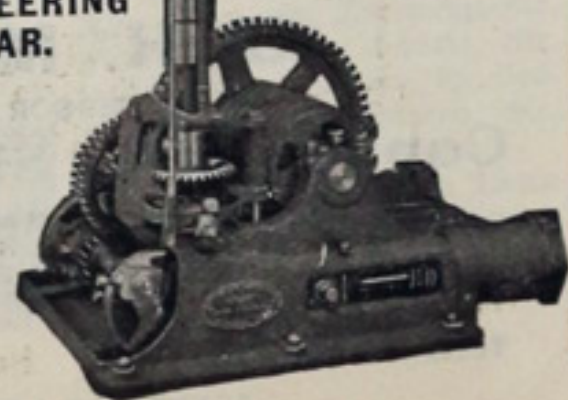


**SIMPLE,
STRONG
and
RELIABLE.**

Changed from
Steam
to
Hand
by one
Lever
in
Less
Than
One
Second

No. 8
BECK
Patent
Steam
and Hand
**STEERING
GEAR.**

BUILT BY
**Pawling &
Harnischfeger,**
MILWAUKEE,
WIS.

**DIXON'S Lubricating Graphite**

Is fully explained in an **INTERESTING AND INSTRUCTIVE PAMPHLET** which is **FREE** to all interested. It will pay all Engineers and Machinists to **SEND FOR IT.**

JOS. DIXON CRUCIBLE CO., JERSEY CITY, N. J.

Chas. Corv & Son

Manufacturers of the
**Mechanical and Electric
Marine Telegraph,**



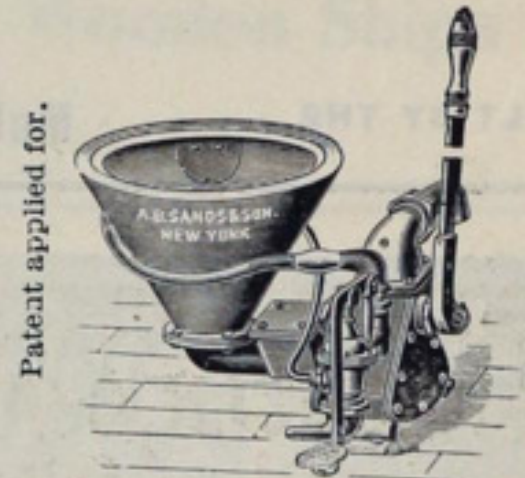
**Electrical
Helm Indicator
Electric Call
Bells.**

Engine Bells and
Brass Work of
all descriptions,
Shrieking and
Siren Whistles.

**278 DIVISION ST.,
NEW YORK CITY.**

Alfred B. Sands & Son
YACHT PLUMBERS,

AND MANUFACTURERS OF
YACHT PLUMBING SPECIALTIES.

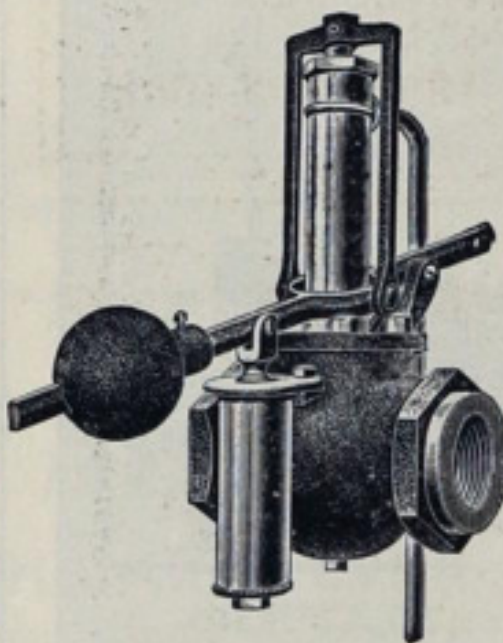


Patent applied for.

The only pump water closet in the world so
constructed as to be positively free
from danger of flooding.

**Folding Lavatories, Pumps, Ventilators,
Etc., Etc.**

134 Beekman St., NEW YORK.

**The "DAVIS" Pressure Regulator
and Reducing Valve.**

Is the simplest and best for reducing the pressure
to Steam Steering Engines, Donkey Engines,
Steam Winches and all places requiring a uniform
pressure below that of boilers.

No diaphragms, spring or packing.

Cut shows ball weight. We can furnish scale
weights if preferred.

MANUFACTURED BY

G. M. DAVIS & CO.
106 N. Clinton St., CHICAGO, ILL.

FOR SALE BY

R. E. Hills, Chicago. C. H. McCutcheon, Buffalo
Geo. Worthington Co., Cleveland.
P. M. Church, Sault Ste. Marie. Jas. Walker & Son, Detroit
Jas. Clements & Son, Bay City, Mich.
Cleveland Ship Building Co., Cleveland.
Chicago Ship Building Co., Chicago.

Selling agents—The McIntosh-Huntington Co., Cleveland, O.; The Detroit Sheet Metal
and Brass Works, Detroit, Mich.

NEVERSINK CORK JACKET AND LIFE BELT.

Warranted 24 lb. Buoyancy and full Weight of Cork, as required by U. S. Inspectors
Consolidated Cork Life Preservers. Superior to all others. Ring Buoys and Fenders.

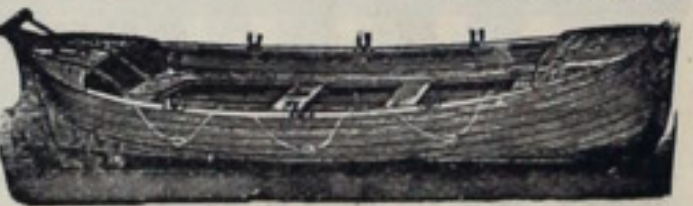
SAFEST, CHEAPEST. Approved and adopted by U. S.
Board of Supervising Inspectors.

Also adopted by the principal Ocean, Lake and River
Steamer Lines as the only Reliable Life Preserver. Vessels
and the trade supplied. Send for catalogue.

Awarded four Medals by World's Columbian Exposition



**Metallic
and
Wooden
Life
Boats.**

**Metallic Life Rafts, Marine Drags.**

Manufacturer of Woolsey's Patent Life Buoy, which is the
lightest, cheapest and most compact Life Raft known.

Send for Illustrated Catalogue.

Get our prices before buying elsewhere.

D. KAHNWEILER,

437 Pearl Street, NEW YORK CITY.

SHERIFFS STEAM STEERER.**MADE IN TWO SIZES**

Are easy to adjust and can
be handled by any one.

The Steerer can be arranged
to set in pilot house or aft.

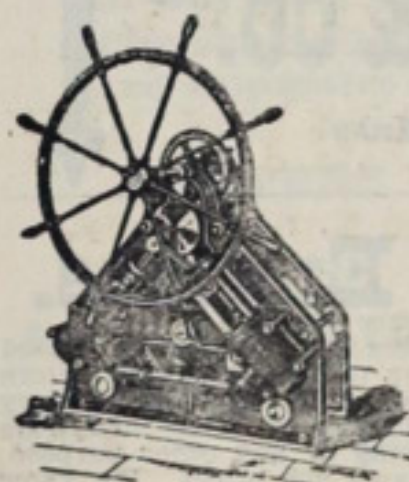
No Steerer will be sold with-
out a quadrant.

Steerer will be sold on ap-
proval.

Manufactured by

SHERIFFS MFG. CO.

126-130 Barclay Street,
MILWAUKEE, WIS.

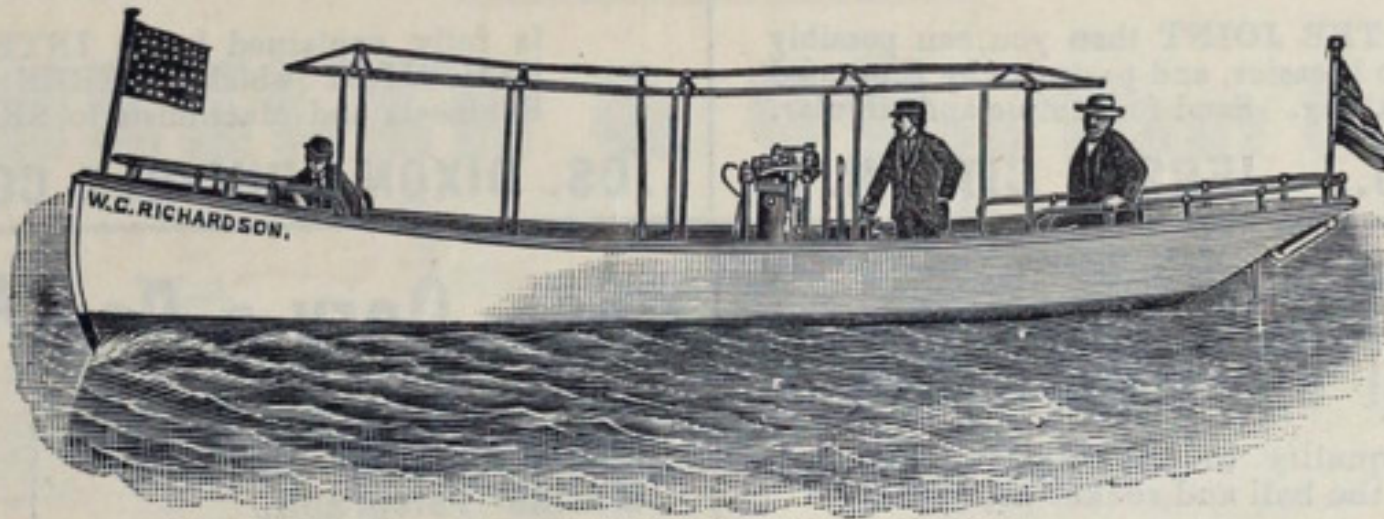


The Wootters Gas Engine.

Especially adapted for launches and ferry boats. Fitted with friction clutch or reversible shaft.

These engines are giving entire satisfaction in the pleasure yacht W. C. Richardson and the delivery launch Lotta.

Prices and particulars furnished on application.



NAPHTHA LAUNCH W. C. RICHARDSON, (Engine 8 horse power—speed 8 miles an hour.)

BUILT BY THE McMYLER MFG. CO., GAS ENGINE DEPARTMENT, 180 Columbus St., CLEVELAND, O.

THE Swain Wrecking Co.
E.M. PECK, Pres.

The TUG FAVORITE
STATIONED AT CHEBOYGAN, MICH.
WITH COMPLETE WRECKING OUTFIT
IN CHARGE OF
Capt. P. L. Millen
CANADIAN WRECKER SAGINAW
STATIONED AT DETROIT, MICH.
ABLES US TO WRECK IN CANADIAN
WATERS
STEAM PUMPS AND SUB-MARINE
WORK IN CHARGE OF
JOHN S. QUINN.
Address all communications to
PARKER & MILLEN
OFFICE AT WATER ST. WEST,
DETROIT, MICH.

4 STEAM PUMPS, 10 JACKS, 3 HAWSERS.
1 COAL AND ORE PUMP
3-12 INCH ROTARY,
1-14 INCH WORTHINGTON.
DIVING RIGS
AND
DIVERS
ABOARD
ALL TIMES
TELEGRAPH
PARKER & MILLEN,
DETROIT, MICH.
Capt. P. L. Millen
CHEBOYGAN, MICH.

**STANDARD AUTOMATIC
RELEASING HOOK**

For NAPHTHA LAUNCHES and boats
of all sizes and descriptions.

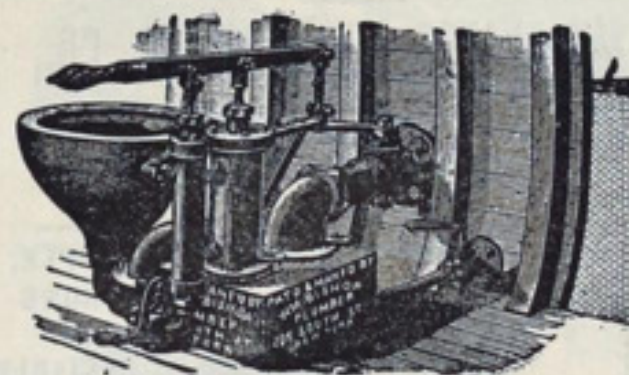
Will release a boat immediately in
the roughest sea or under speed and
can be hooked on without delay or
injury to the hands of men hooking
it on. For further information ap-
ply to

STAND'T AUT. RELEAS'G HOOK CO.,
22 and 24 State Street, New York.

KATZENSTEIN'S Self-Acting METAL PACKING,

For PISTON RODS, VALVE STEMS, etc., of every description,
for Steam Engines, Pumps, etc., etc.
Adopted and in use by the principal Iron Works and Steamship
Companies, within the last twelve years, in this and foreign
countries.
FLEXIBLE TUBULAR METALLIC PACKING, for slip-joints
on Steam Pipes, and for Hydraulic Pressure; also METAL
GASKETS for all kinds of flanges and joints.
DOUBLE-ACTING BALANCED WATER-TIGHT BULKHEAD DOORS for
Steamers. Also Agents for the McColl-Cumming PATENT LIQUID
RUDDER BRAKE. For full particulars and reference, address:
L. KATZENSTEIN & CO.,
General Machinists, Brass Finishers, Engineers' Supplies,
357 West St., New York.

PATENT PUMP WATER CLOSET.



For Yachts, Naval Ships, Etc.

WM. BISHOP'S SONS, PLUMBING and STEAM FITTING "MARINE SPECIALTIES."

Patentees and Manufacturers of the
only Pump Water Closet that is
safe below water line.

**BRASS AND COPPER PUMPS,
LAVATORIES, ETC.**

205 South St., - New York.
724 Third Ave., Brooklyn, N.Y.
Telephone.

Ship Lamps
OIL AND ELECTRIC FIXTURES
— FOR —
Steamships, Yachts, &c.
GREAT VARIETY OF DESIGNS.
Prices and Cuts on Application.
PAGE BROS. & CO.
347 to 357 Cambridge St. Boston, Mass.

Hoisting Engines.

We build them in all sizes from new and improved
designs. Every engine thoroughly tested before
leaving our shop, and guaranteed to be satisfactory
in every case. When in want of a Hoist for marine
work, dock work, mining or any other purpose,
kindly permit us to name you prices. We know
we can please you.

Marine Iron Co., Bay City, Michigan.

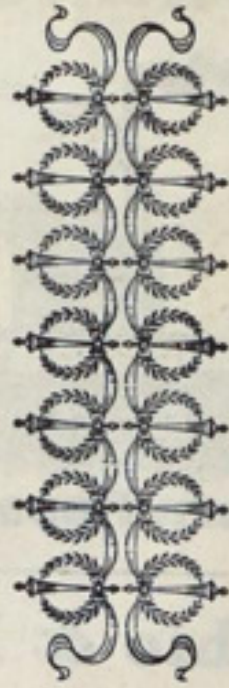
MIERS GORYELL Consulting Mechanical Engineer,
Plans, Specifications and Superin-
tendence. Marine and Water Works
Engines and Boilers.
21 E. 21st Street, NEW YORK.

Excelsior Straight-Way Back Pressure Valve.

This valve has no dash pots, springs, guides or complicated
levers to get out of order. It is simple, reliable and well-made.
Never sticks, and can be relied upon at all times when using
exhaust steam for heating; or when used as a relief, or free ex-
haust on a condensing plant, it has no equal. It is noiseless
and free from any complicated attachments.

JENKINS BROTHERS, NEW YORK, PHILADELPHIA, BOSTON, CHICAGO.

C. H. McCUTCHEON,
(SUCCESSOR TO SAMUEL McCUTCHEON.)
Copper, Tin & Sheet Iron Manufactory
STEAMBOAT AND ENGINEERS' SUPPLIES.
All kinds of Brass Cocks, Globe Valves and Couplings, &c. Iron Pipe and
Fittings, and Mill Supplies. Rubber Belting, Hose and Packing,
Springs, Valves, &c. Leather Belting and Usdurian Packing.
TELEPHONE No. 68. NO. 18 OHIO STREET, BUFFALO, N. Y.
AGENT FOR LAKE CARRIERS' CYLINDER OIL.



CRAIG SHIP BUILDING CO.

TOLEDO, OHIO,
METAL & WOODEN SHIP BUILDERS.

New Dry Dock—450 feet long, 110 feet wide on top,
55 feet wide on bottom, 16 feet of Water on Sill.

Repairs to Metal and Wooden Ships
A SPECIALTY.

MARINE VALVE OIL FOR INTERNAL LUBRICATION.

RENOWN ENGINE OIL FOR EXTERNAL LUBRICATION



Marine Valve,
Renown Engine,

Eldorado Engine,
Crank Case,

Victor Signal,
Dark Lubricating,

Mineral Seal,
Head Light,

Artic Cup Greases,
and Lard Oils.

— CARRIED IN STOCK AT THE —

STANDARD OIL COMPANY'S MARINE DEPOT,

TELEPHONE 77.

123 River Street, CLEVELAND, O.

MAIN OFFICE TELEPHONE 682.

ALSO FOR SALE
BY
STANDARD OIL
COMPANY,

Chicago, Ill., No. 5 Wabash Ave.
Racine, Wis.
Milwaukee, Wis., Broadway & Mason.
Sheboygan, Wis.
Manitowoc, Wis.
Green Bay, Wis.

Marinette, Wis.
Oshkosh, Wis.
Duluth, Minn.
West Superior, Wis.
Hancock, Mich.
Marquette, Mich.

Buffalo, N. Y.
Sault Ste. Marie, Mich.
West Bay City, Mich., M.C. Ry. & 10th St.
Saginaw, Mich., Eighth & Sears Sts.
Detroit, Mich., 46 Jefferson.
Toledo, O., Summit & Monroe Sts.



ATLANTIC REFINING COMPANY, French & 16th Sts., Erie, Pa.
D. ROBESON, Port Huron, Mich.
W. S. MCKINNON, Ashtabula Harbor, O.
HULL & RAND, Huron, O.

EDWARD BRAMMALL, Benton Harbor, Mich.
BABY & DALE, St. Clair, Mich.
N. C. ALLEN, Lorain, O.
A. F. HARRINGTON, Conneaut Harbor, O.

A. H. MCGONAGIL, South Chicago, Ill.
MARINE SUPPLY Co., Fairport, O.
F. KRANZ, Sandusky, O.
THE M. I. WILCOX CORDAGE & SUPPLY Co., Toledo O

1897 Blue Book of American Shipping

"IS THE BEST BOOK OF THE KIND EVER PUBLISHED,"

at least that seems to be the almost universal verdict of purchasers and advertisers.

ORDER A COPY, Price \$5, and if you are not satisfied with the
book, we will pay express both ways and credit the \$5.

BLUE BOOK OF AMERICAN SHIPPING,
409 Perry-Payne Building, CLEVELAND O.

"The most perfect feed water heater and purifier we ever saw."—R. HAMMOND.

IN PRACTICAL USE ON 25 LAKE STEAMERS.

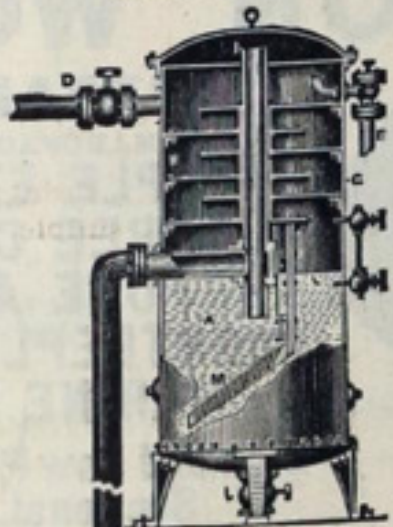
Every Purifier Warranted to Remove all Sediment or
Scale-Forming Substance.

ROBERT LEARMONTH PATENTEE,

200 LAFAYETTE AVENUE, - - - - - BUFFALO, N. Y.

SEND FOR CIRCULAR.

THE BUFFALO
FEED WATER
HEATER
AND PURIFIER.



Names of Steamers on the Lakes
using the

**Buffalo Feed Water
Heater and Purifier.**

RED STAR LINE.—Str. Robert
Mills, Str. Wyoming.

BAY CITY, MICH.—Str. H. C.
Sibley, Str. B. Boutelle.

ANCHOR LINE.—Str. Mahoning,
Str. Schuykill, Str. Codoris, Str.

S. S. Squehanna, Str. Clarion, Str.
Lehigh, Str. India, Str. China,

Str. Japan, Str. Lyeoming, Str.
Conemaugh, Str. Juniata, Str.

Alaska, Str. Delaware, Str. Con-
estoga, Str. Wissahickon, Str.

Philadelphia, Str. Winslow.

LAKE MICHIGAN AND LAKE
SUPERIOR TRANSPORTATION
Co.—Str. Manitou.



Nickel Plate Ahoy? Aye, Aye Sir!
The line to hail and the line to take
To reach your craft to fit her out,
Is the well-known ship-shape Nickel Plate Route,
Chicago, Cleveland, Buffalo,
Or any port you want to go,
The shortest time and the lowest rate
Are shipmates with the Nickel Plate.

A SUPERB DINING CAR SERVICE.

For particulars inquire of

A. W. JOHNSTON,
Genl. Supt.

or, **B. F. HORNER**
Genl. Pass. Agt.

Cleveland, O.

STEAM ENGINEERING

(Stationary, Locomotive, Marine; Mechanical Drawing; Architectural Drawing; Machine Design; Electricity; Architecture; Plumbing; Railroad, Municipal, 31 COURSES Hydraulic Engineering; Surveying and Mapping; Metal Pattern Cutting; Bookkeeping; Shorthand; English Branches; Mining; Metal Prospecting. All who study **GUARANTEED SUCCESS.** Fees Moderate, Advance or Installments. Circular Free; State subject you wish to study. International Correspondence Schools, Box 985, Scranton, Pa.



HARVEY D. GOULDER,
LAWYER AND PROCTOR IN ADMIRALTY,
CLEVELAND, O.

ALBERT J. GILCHRIST, PROCTOR IN ADMIRALTY,
No. 604 PERRY-PAYNE BLDG., CLEVELAND, OHIO.

AMBROSE V. POWELL, C.E., * * Consulting Engineer.
Specialties: Designing and Construction of DRY DOCKS, Harbor Works,
Docks and Plants for Handling Coal and Ore.
Office, 507 Chamber of Commerce, - CHICAGO, ILL.

C. E. KREMER, Attorney and Counselor-at-Law and
Proctor in Admiralty.
Rooms 14, 15 and 16, Bryan Block, - 184 LA SALLE ST., CHICAGO, ILL.

HARVEY L. BROWN,
Counselor at Law and Proctor in Admiralty,
35 White Building, BUFFALO, N. Y.

HAWGOOD & MOORE W. A. HAWGOOD,
J. W. MOORE.
Vessel and Insurance Agents,
Residence Phone, Doan 446—W. A. Hawgood,
Long Distance Tel. 2395. 608 Perry-Payne Bldg., CLEVELAND, O.

W. C. RICHARDSON,
VESSEL AND MARINE INSURANCE AGENT.
Office Telephone 338, Nos. 606 & 607 Perry-Payne Bldg., Cleveland, O.
Residence Telephone 2938.

J. H. BARTOW, TELEPHONE 717.
Vessel and Insurance Agent,
611 and 612 Perry-Payne Bldg., Cleveland, O.

JOHN MITCHELL, JOHN F. WEDOW, ALFRED MITCHELL.
MITCHELL & CO.,
Vessel and Insurance Agents,
508, 509 and 510 Perry-Payne Building, CLEVELAND, OHIO
Office Telephone, 787. Residence, John Mitchell, 3506.

C. R. JONES & CO., VESSEL AGENTS,
FIRE AND MARINE INSURANCE.
Nos. 501, 502 and 503 Perry-Payne Bldg., CLEVELAND, O.

THOS. WILSON,
MANAGING OWNER
WILSON'S TRANSIT LINE.
Gen. Forwarder.
Freight and Vessel Agent.
CLEVELAND, O.

J. T. ROSE, FRANK B. LAZIER.
ROSE & LAZIER,
Vessel Agents and Brokers,
and Marine Insurance,
16 Board of Trade,
DULUTH, - MINN.

PATENTS

Quickly secured. OUR FEE DUE WHEN PATENT OBTAINED. Send model, sketch or photo, with description for free report as to patentability. 48-PAGE HAND-BOOK FREE. Contains references and full information. WRITE FOR COPY OF OUR SPECIAL OFFER. It is the most liberal proposition ever made by a patent attorney, and EVERY INVENTOR SHOULD READ IT before applying for patent. Address:

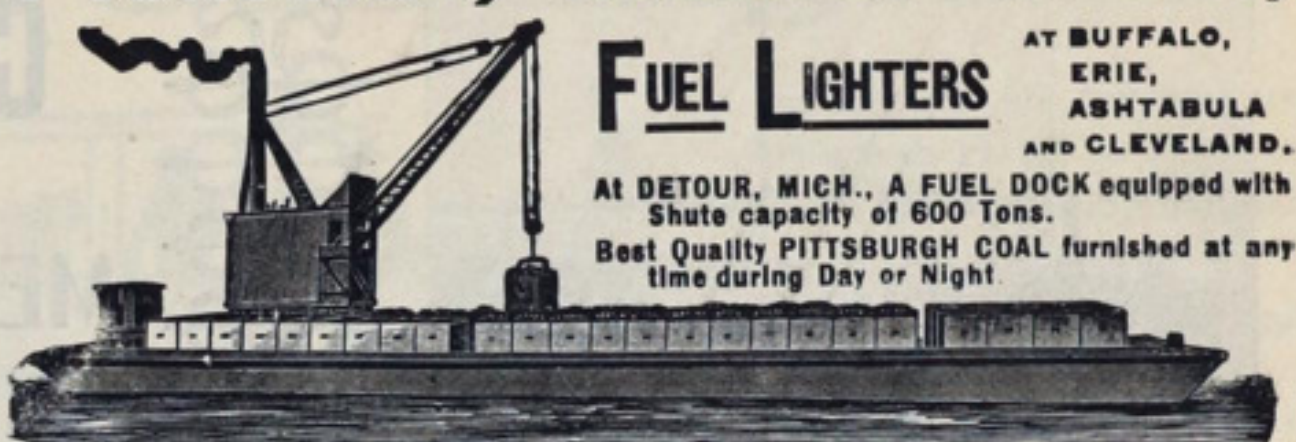
H. B. WILLSON & CO.
PATENT LAWYERS,
Le Droit Bldg., WASHINGTON, D. C.

J. J. H. Brown, Edward Smith,
J. B. Rodgers.
BROWN & CO.,
Vessel and Insurance Agents,
202 Main St.,
BUFFALO, N. Y.

White, Johnson & McCaslin,
ATTORNEYS-AT-LAW,
—AND—
Proctors in Admiralty,
26-27 Blackstone Building,
CLEVELAND, - OHIO.

ORESTES C. PINNEY,
Lawyer and Proctor in Admiralty.
Rooms 722 and 723 Perry-Payne Bldg.
CLEVELAND, OHIO.
Telephone 2585.

C. W. ELPHICKE, JAS. A. MYERS,
CALVIN CARR.
C. W. ELPHICKE & CO.
GENERAL INSURANCE AGENTS,
Room 10, No. 6 Sherman St., Chicago, Ill.

Pickands, Mather & Co.,

Western Reserve Building, CLEVELAND, O.

FUEL LIGHTERS

AT BUFFALO,
ERIE,
ASHTABULA
AND CLEVELAND.

At DETOUR, MICH., A FUEL DOCK equipped with
Shute capacity of 600 Tons.
Best Quality PITTSBURGH COAL furnished at any
time during Day or Night.

Ohio & Pennsylvania Coal Co.

FUEL DEPARTMENT.
MINERS AND SHIPPERS,

Youghiogeny and Ohio Steam Coals. Steamboats, Tugs, etc., Coaled day or
night, DOCKS FOOT WEST RIVER STREET. WHISKEY ISLAND GOVERNMENT
PIER and C. & P. R. R. SLIPS. Also STEAM LIGHTER—Equipped with
Revolving Derrick and (100) two ton buckets.
Telephone 1608. Office, 130 West River St., CLEVELAND, OHIO.

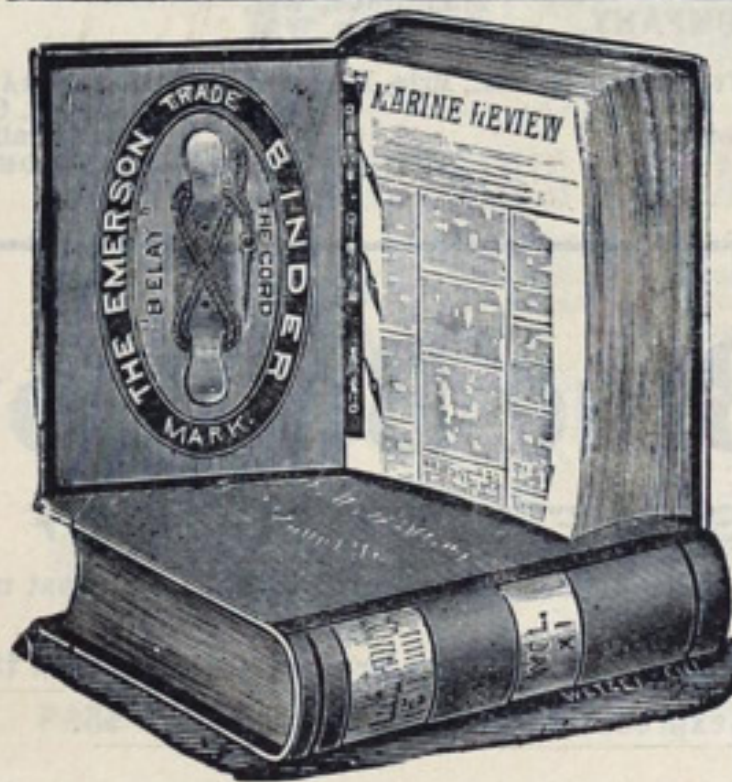
THE PITTSBURGH AND CHICAGO GAS COAL CO.

MINERS AND SHIPPERS OF

Pittsburgh and Youghiogeny Coal.

Fuel Docks West Side of Main River, Cleveland, Ohio, just above Main St. Bridge.
Latest equipment for rapid fueling of Steamers at all hours, day or night.
Fuel Lighter 300 tons capacity; buckets 2½ tons capacity.

Telephone { Office 1888.
Fuel Dock 1590.
Ore Dock, 2413. J. A. DONALDSON, Agent,
420-421 Perry-Payne Building

**ONE OF THESE BINDERS**

that will hold 52
NUMBERS
of the

MARINE REVIEW,

Will be mailed to
any address on
receipt of \$1.

MARINE REVIEW...

409 Perry-Payne Bldg.,
CLEVELAND, O.

H. A. BARR, PRESIDENT, F. H. VAN CLEVE, SMC. CAPT. GEO. BARTLEY, SUPT.
Escanaba, Escanaba, Escanaba, Mich.

ESCANABA TOWING & WRECKING CO., Escanaba, Mich.

Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks and Diving Appliances always ready.
TUG MONARCH, { Engine Compound, Cylinder 16 and 30 inches diameter, 30 inch-
Stroke, Steam Pressure Allowed, 125 pounds.
TUG DELTA, { Cylinder 20 by 22, Steam Pressure Allowed, 105 pounds.
TUG OWEN, { Cylinder 20 by 20, Steam Pressure Allowed, 104 pounds.

CENTRIFUGAL PUMPS, Seven and Fourteen Inch Suction**H. G. TROUT, KING IRON WORKS,**

BUFFALO, N. Y..

MANUFACTURERS OF
TRIPLE EXPANSION,
THREE CYLINDER,
FORE AND AFT
And STEEPLE COMPOUND
MARINE ENGINES,

High and Low Pressure Engines,
Sectional Propeller,
Tug and Yacht Wheels,
Cowles Aluminum and Manganese
Bronze Propeller Wheels.

These Wheels are noted for their extra
speed, towing power and propor-
tionate saving of coal.

PRICES QUOTED ON APPLICATION.

42 Lake Steamers with 54,010 I. H. P.

EQUIPPED (OR ORDERED) WITH THE

HOWDEN

BY THE

DRY DOCK ENGINE WORKS,

DETROIT, MICHIGAN.

HOT DRAFT

TOTAL EQUIPMENT IN THE WORLD,

1,561,400 I. H. P.

PAMPHLET FURNISHED ON APPLICATION

WHAT IT DOES.

Causes Large Saving in Fuel.

Saves from 10 cts. to 50 cts. per ton in
quality of fuel used.

Increases Speed, Carrying Capacity
and Earnings.

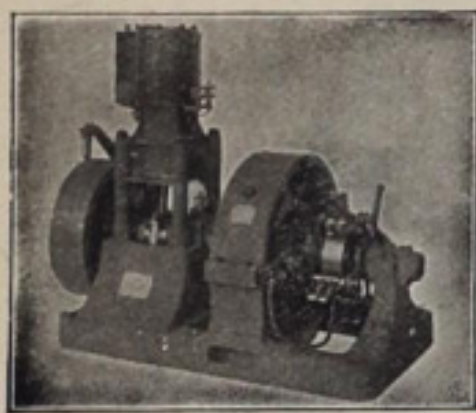
HOW IT DOES IT.

Maintains an Even Draft.

Furnishes Hot instead of Cold Air to
the Furnaces.

Makes all the Steam any kind of
Engine can use.

FREE WINTER DOCKAGE FOR STEAMERS WHOSE OWNERS CONTEMPLATE A HOWDEN EQUIPMENT.



Complete Electric Plants for Light and Power

On STEAMSHIPS, WHALEBACKS, YACHTS, DOCKS, WHARVES, Etc.

Our system is complete in every detail. All our appliances are made to Governmental and Insurance requirements and are perfect. Write for prices and catalogues.

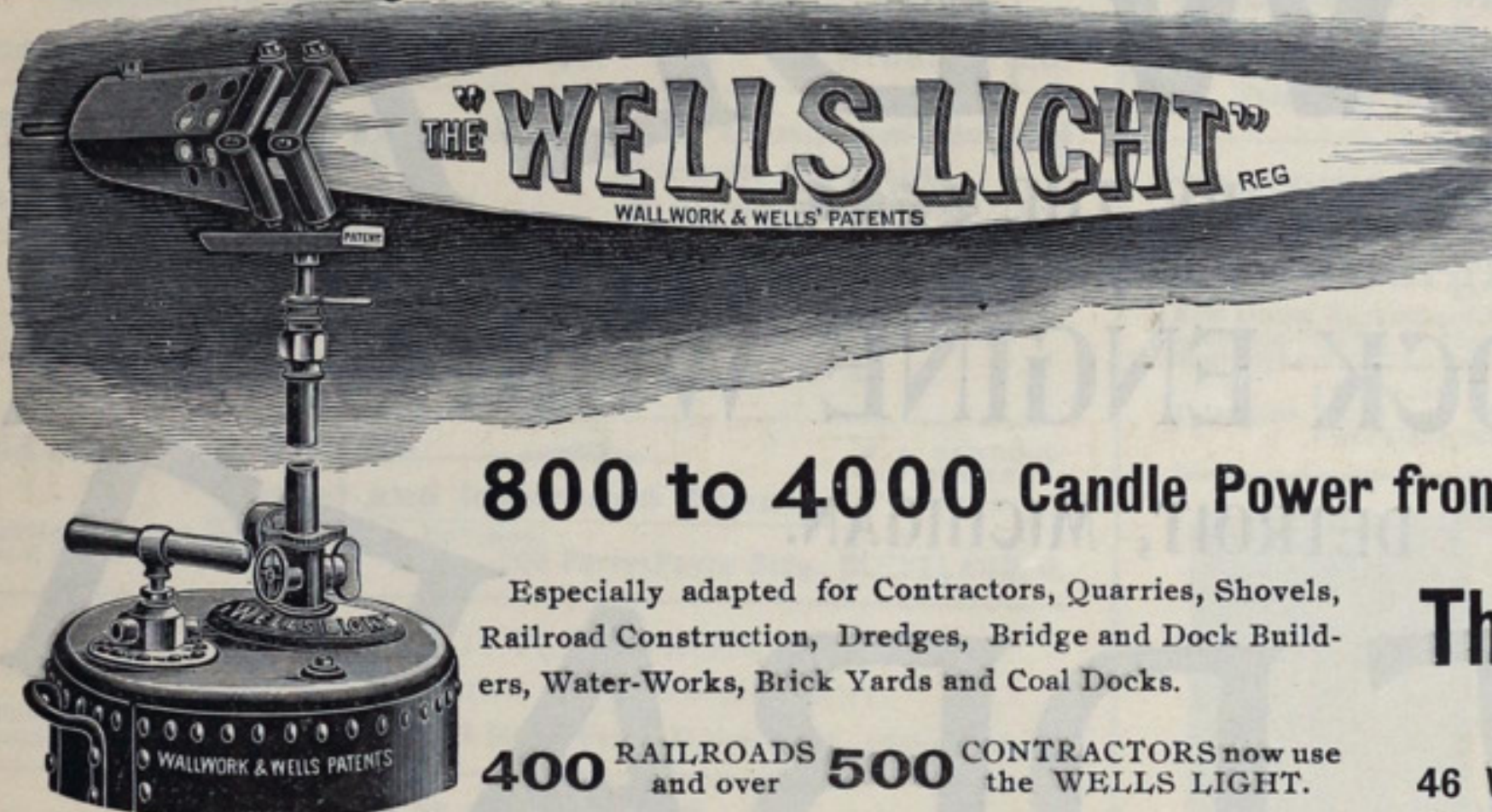
General Electric Company.

SALES OFFICES
 Schenectady, N. Y. Chicago, Ill. Detroit, Mich. Buffalo, N. Y. Columbus, O.
 Boston, Mass. Philadelphia, Pa. Baltimore, Md. Portland, Ore. San Francisco, Cal.
 New York, N. Y. New Orleans, La.



FRONTIER IRON WORKS

MARINE ENGINES, DETROIT, MICH.



10,000 IN USE.

Unaffected by Weather.

Portable, Self Contained.

800 to 4000 Candle Power from KEROSENE OIL.

Especially adapted for Contractors, Quarries, Shovels, Railroad Construction, Dredges, Bridge and Dock Builders, Water-Works, Brick Yards and Coal Docks.

The Wells Light Mfg. Co.

EDWARD ROBINSON, Sole Proprietor.

46 Washington Street,

NEW YORK.

400 RAILROADS and over 500 CONTRACTORS now use the WELLS LIGHT.

THE BETHLEHEM IRON CO.

Works & Principal Office, South Bethlehem, Penn.

Marine Engine Forgings

of all descriptions, made either SOLID or HOLLOW from Fluid-Compressed Hydraulic-Forged Open Hearth Steel.

Ship-Plates. Boiler-Plates. Tank-Plates.

NEW YORK OFFICE, - - 100 Broadway.
 PHILADELPHIA OFFICE, - - 421 Chestnut St.
 CHICAGO OFFICE, - - Marquette Bldg.

THE W. L. SCOTT CO.

Wholesale Dealers in

Shamokin, Wilkesbarre, and Hazleton-Lehigh

COALS.

Mansfield Steam Coal.

FUELING VESSELS a specialty, either from dock or steam scow Mansfield, capacity 300 tons, in buckets, which gives quick dispatch. Boats coaled day or night. Docks lighted with electricity and equipped with steam derricks.

Fueling Office at Canal Dock, ERIE, PA.

Cuddy-Mullen Coal Co.

Miners and Shippers of Steam Coal

FUELING DEPARTMENT FACILITIES:

CLEVELAND HARBOR—

Car Dumper; Eight Pockets 1,000 tons capacity; Three steam Derricks; Lighter.

DETROIT RIVER BRANCH—

Amherstburg, Four Pockets and Three Steam Derricks; Sandwich, Ten Pockets and Two Steam Derricks.

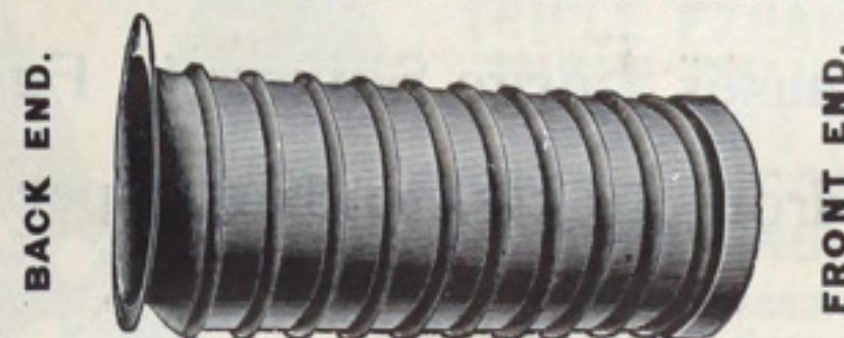
SAULT RIVER BRANCH—

Two Docks at Detour (formerly known as the Anthony and Watson Docks) Equipped with Pockets and Steam Derricks.

Good Coal; Courteous Attention; Quick Dispatch.

General Offices: Perry-Payne Bldg., Cleveland, O.

PURVES' RIBBED STEEL BOILER FURNACE FLUE.



With this style of Furnace Flue, the rivets at the "back end" are out of the line of fire, and all that has to be done to remove it is to cut out the rivets at the ends and slip it through the front; and to replace it, simply to slip it back in its place and rivet up the ends again without disturbing any other part of the boiler. No smith work is required to fit it in a boiler or to refit it when replaced. It is ready for use as it comes from the manufacturers. This style of Flue has been in use six years without a single complaint.

Over 16,000 of Purves' Ribbed Steel Furnace Flues in successful use in Marine Boilers.

ELLIS & EAVES SYSTEM OF INDUCED OR SUCTION DRAFT.

CHARLES W. WHITNEY,

Sole Agent for the United States and Canada,
 Bowling Green Building, 5 to 11 Broadway, New York City.

S. F. HODGE & CO.

MARINE ENGINES,
PROPELLER WHEELS,
DECK HOISTERS,
MARINE REPAIRS.
320 ATWATER STREET,
DETROIT, MICH.

THE BABCOCK & WILCOX CO.

29 CORTLAND STREET,
NEW YORK.

FORGED STEEL WATER-TUBE MARINE BOILER,

Light, durable, easily cleaned and inspected. Only straight tubes are used.

The largest cargoes on the Lakes are carried by steamers using BABCOCK & WILCOX boilers.

The fastest of the six composite Gunboats recently constructed for the U. S. N. (MARIETTA and ANNAPOLIS) are equipped with these boilers.

Boilers also ordered for U. S. N. CHICAGO and ATLANTA.

BAR IRON THE BOURNE-FULLER CO. PIG IRON CLEVELAND, O.

SHIP PLATES, BOILER PLATES,
ANGLES, BEAMS, CHANNELS, BARS,
BOAT SPIKES, CLINCH RINGS,

SALES AGENTS:

THE CAMBRIA IRON CO.

— Mfrs. of Open Hearth and Bessemer Steel. —

De Grauw, Aymar & Co.,
34-35 South Street,
NEW YORK, N. Y.



Sole Selling Agents
in the
United States
for

TYZACK'S STOCKLESS ANCHORS

Over 100
of these Anchors
on Lake Vessels.

DETROIT SHEET METAL AND BRASS WORKS

No. 64-66-68-70-72
ORLEANS STREET,
DETROIT, MICH.

Jobbers of..... Pipe, Valves, Fittings, Packing, Oil and
Engineers Supplies.

Contractors for High Class Steam Fitting, Steam Heating,
Plumbing, Copper Work, and all
Classes of Sheet Metal Work.

Manufacturers of Clark's Patent Metallic Life Raft, Side
Lights, Marine Hardware, Hurricane,
Cabin and Platform Lamps, Trip
Gongs, etc.

Agents for..... Laidlaw - Dunn - Gordon Steam Pumps,
Warren Webster's Specialties, and
Buffalo Forge Co.'s Fans, Engines and
Heaters.

Engineers can be waited on promptly day or night.

Steamboat Fuel at Ashtabula.

Large Supplies of Best Quality.

Lighter

Carrying
Different
Grades
at all
Times.



M. A. HANNA & CO.,

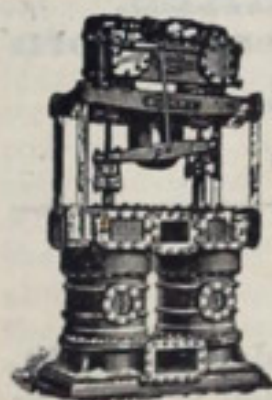
Main Office, Perry-Payne Bldg., Cleveland.

Miners and Shippers.

THE GEO. F. BLAKE MFG. CO.

BUILDERS OF

MARINE PUMPS



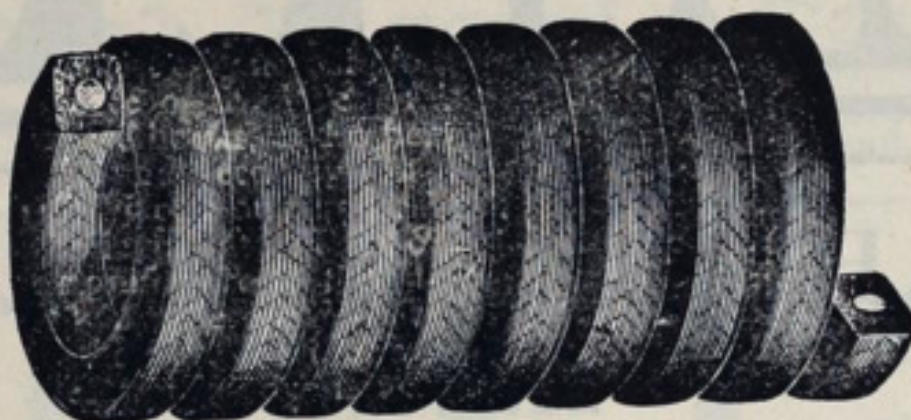
Single and Duplex Pumps for Boiler Feed,
Fire or Bilge Service—Vertical and Horizontal.
Vertical and Horizontal Pumps, Air Pumps
for Surface and Jet Condensers.

AIR PUMP ON
U. S. CRUISER NEW YORK.

95 and 97 Liberty St., NEW YORK.

"HONEST JOHN," 193-195 Bank St., CLEVELAND, O.

MADE BOTH
STRAIGHT
AND SPIRAL.



PUT UP
IN
BOXES.

HYDRAULIC RAINBOW CORE PACKING.

WRITE US FOR TESTIMONIALS.

16-24 Woodward Avenue,
DETROIT, MICH.

PEERLESS RUBBER MFG. CO.,
16 Warren Street,
NEW YORK.

202-210 So. Water St.,
CHICAGO, ILL.

The Cleveland Dry Dock Co.



148 Elm St.,
Cleveland, O.
Telephone 1616.
Resid. Phone 3634.

REPAIRING
A SPECIALTY.

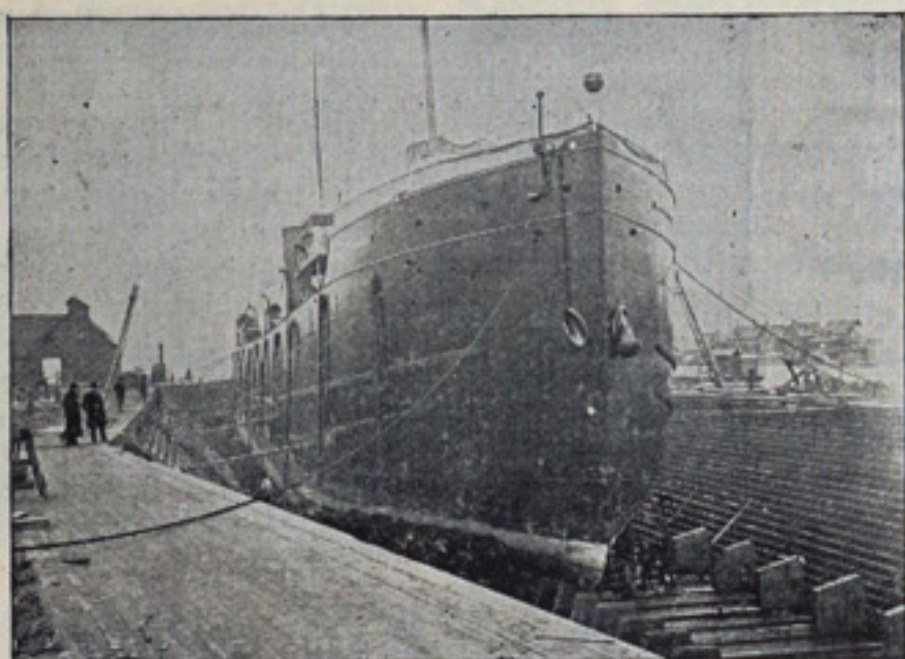
Dimensions of Dock:
Lth. over all, 360 ft.
Lth. on blocks, 340 ft.
Width of gate, 50 ft.
Depth over sill, 20 ft.

Capt. W. W. BROWN,
Sec'y & Mgr.

AMERICAN STEEL BARGE CO. STEEL and METAL SHIPS

Of all classes built on the Shortest Possible Notice at our yards at
West Superior, Wis., and also at Everett, Wash.

Plates &
Material
Always
on hand
to Re-
pair all
kinds of
Metal
Ships in
Shortest
Time.



Best
Quality
of Oak
instock
for Re-
pairing
Wooden
Vessels
of all
Classes.

SIZE OF DOCK.

Length, extreme.....537 feet.	Entrance, Top.....55 feet 9 in
Breadth, Top.....90 " 4 in.	Entrance, Bottom.....50 "
Breadth, Bottom.....52 "	Depth over Sills.....18 "

LARGEST DRY DOCK ON THE LAKES.
Prices for Repairs and Docking same as at lower lake ports
SUPERIOR, WIS.

A number of Propeller Wheels in stock at Dry Dock.

H. C. BURRELL

MARINE REPORTER, DETROIT.

Small boat on the river at all hours of the day and night.
Let us give you prices on delivery of orders and other business at Detroit. Engineers and firemen, mates and deck hands, furnished on short notice.

Office Foot of Woodward Ave.



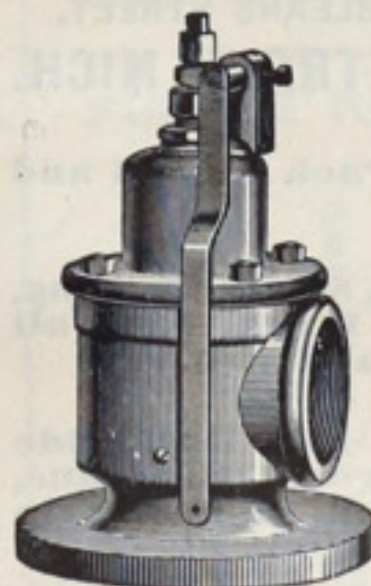
DELTA METAL

REG TRADE MARKS

"Phosphor Bronze"
THE PHOSPHOR BRONZE SMELTING CO. LIMITED,
2200 WASHINGTON AVE., PHILADELPHIA.
"ELEPHANT BRAND PHOSPHOR-BRONZE"
INGOTS, CASTINGS, WIRE RODS, SHEETS, ETC.
— DELTA METAL —
CASTINGS, STAMPINGS AND FORGINGS.
ORIGINAL AND SOLE MAKERS IN THE U.S.

PROPELLERS.

CROSBY STEAM GAGE AND VALVE CO.



CROSBY POP SAFETY VALVES. Locomotive, Marine and Stationery.
CROSBY WATER RELIEF VALVES, for Pumps, Hydrants, etc.
CROSBY IMPROVED STEAM PRESSURE GAGES.
CROSBY STEAM ENGINE INDICATORS, with Sargent's Electrical Attachment for taking any number of Diagrams simultaneously.

The Original SINGLE BELL CHIME WHISTLES.
BRANDEN PUMP VALVES; rubber with wire-coil insertion.
BOSWORTH FEED-WATER REGULATOR, PATENT GAGE TESTER, and many other specialties in Steam Lines.

Main Office and Works: Boston, Mass.

Stores: Boston, New York, Chicago, and London, Eng.

WE WILL REPAIR YOUR STEAM FITTINGS PROMPTLY.

ALL RELIABLE statistics relating to shipping are contained in the Blue Book of American Shipping. Price, \$5. MARINE REVIEW, Cleveland.